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UNITED STATES DEPARTMENT OF COMMERCE

Charles Sawyer, Secretary

OFFICE OF TECHNICAL SERVICES

John C. Green, Director

Comm-DC 15796

APPAREL

FACIAL SKIN TEMPERATURE WITH K-1 ALTITUDE HELMET HEATED FACEPIECE, by R. H. Middleton and David I. Mahoney. U. S. Air Force. Wright Air Development Center. Research Division. Aero-Medical Laboratory, Wright-Patterson Air Force Base, Dayton, Ohio. Oct 1951. 8p photo, tables Microfilm $1.25, Photostat $1.25. PB 106276

1. K-1 (Helmet) 2. Helmets, Flying - Tests 3. Skin - Temperature 4. AAF TSEAA MR 660-100-J.

FITTING OF T-1 AND S-2 ALTITUDE SUIT, by Charles C. Lutz and Bradford G. Moore. U. S. Air Force. Wright Air Development Center. Research Division. Aero-Medical Laboratory, Wright-Patterson Air Force Base, Dayton, Ohio. Oct 1951. 7p diagrs, tables Microfilm $1.25, Photostat $1.25. PB 106275

1. T-1 (Flying suit) 2. S-2 (Flying suit) 3. Suits, Flying - High altitude 4. AAF TSEAA MR 660-100-I.

FOOTWEAR. REPORT OF A VISIT TO THE U. S. A. IN 1950 OF A PRODUCTIVITY TEAM REPRESENTING THE BRITISH FOOTWEAR INDUSTRY. Anglo-American Council on Productivity. Oct 1951. 207p photos, drawings (3 fold) tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $2.25. PB 106417

1. Footgear - Manufacture 2. Shoes - Manufacture 3. Shoe industry.

HOSIERY AND KNITWEAR. REPORT OF A VISIT TO THE U. S. A. IN 1950 OF A PRODUCTIVITY TEAM REPRESENTING THE HOSIERY AND KNITWEAR INDUSTRY. Anglo-American Council on Productivity. Apr 1951. 63p photos, map, drawings, tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.75. PB 106434

1. Hosiery - Manufacture 2. Fabrics, Knitted - Manufacture 3. Knitting industry.

MEN'S CLOTHING. REPORT OF A VISIT TO THE U.S.A. IN 1949 OF A PRODUCTIVITY TEAM REPRESENTING THE MEN'S AND YOUTH'S FACTORY-TAILORED CLOTHING INDUSTRY. Anglo-American Council on Productivity. Jun 1950. 103p photos, drawings (1 fold) tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.75. PB 106419

1. Clothing industry.

PROPOSED PROGRAM FOR T-1 ALTITUDE SUIT INDOCTRINATION, by Charles C. Lutz and David I. Mahoney. U. S. Air Force. Wright Air Development Center. Research Division. Aero-Medical Laboratory, Wright-Patterson Air Force Base, Dayton, Ohio. Oct 1951. 31p photos, tables (1 fold) Microfilm $2.25, Photostat $5.00. PB 106274

1. T-1 (Flying suit) 2. Suits, Flying - High altitude 3. AAF TSEAA MR 660-100-H-1.

CHEMICAL AND ALLIED PRODUCTS

Drugs and Pharmaceuticals

1,2-DICHLOROACRYLONITRILE, MEDIAN LETHAL CONCENTRATION FOR MICE, SKIN-IRRITANT ACTION, EFFECT ON EYES, by S. D. Silver, F. P. McGrath, C. M. Hunt, J. Saldick. U. S. Chemical Warfare Service. Medical Division. Jul 1942. 8p graph, tables Microfilm $1.25, Photostat $1.25. PB 106308

1. Acrylonitrile, 1,2-Dichloro 2. CWS TDMR 410. Project A 10.2.

PHARMACEUTICALS. REPORT OF A VISIT TO THE U. S. A. IN 1950 OF A PRODUCTIVITY TEAM REPRESENTING THE PHARMACEUTICAL INDUSTRY. Anglo-American Council on Productivity. Sep 1951. 94p photos, drawings, diagrs Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.75. PB 106422

1, Pharmaceutical industries.

Paints, Varnishes and Lacquers

SURVEY OF ADHESIVES AND ADHESION, by R. C. Rinker and G. M. Kline. U. S. National Advisory Committee for Aeronautics. Aug 1945. 99p diagrs, drawings, graphs, tables Microfilm $4.25, Photostat $12.50. PB 106026

1. Adhesives - Theory 2. Bonding - Theory 3. Bonding, Electrostatic 4. Bonding, Covalent 5. Bonding, Metallic 6. Bonding, Residual 7. U. S. National Bureau of Standards 8. NACA TN 989.

Miscellaneous Chemicals

COLLECTION OF REPORTS ON VARIOUS CHEMICALS AND PHARMACEUTICALS. I. G. Farbenindustrie, A. G. 1933-1944. 1142f (Text in German) Microfilm $9.00, Enlargement Print $150.00. PB 106522

1. Chemicals - Preparation - Germany 2. Pharmaceuticals - Preparation - Germany.

Photographed by Navy 100 Microfilm Section for Surgeon General and Chemical Warfare Service. Reel I.

COLORIMETRIC ANALYSIS OF TRIPHENYL PHOSPHATE, by William A. Conaway, with the technical assistance of Stella E. Gillispie. U. S. Chemical Corps. Medical Laboratories, Army Chemical Center, Maryland. Jan 1952. 15p graphs, tables Microfilm $1.75, Photostat $2.50. PB 106570

The object of this work was to develop an analytical method for determining micro quantities of triphenyl phosphate for use in studies of the impaction of aerosols. Triphenyl phosphate hydrolyzes in 6 N potassium hydroxide forming phenol, which was detected by

coupling with diazo-benzenesulfonic acid. A yellow to red color resulted, the intensity of which was read on a Klett-Summerson photoelectric colorimeter, using a 425 mu. filter. Project no. 4-08-02-006. CC MD RR 97.

HERSTELLUNG VON ACRYLSÄURENITRIL AUS ACETYLEN UND BLAUSÄURE (PREPARATION OF ACRYLONITRILE FROM ACETYLENE), by Dr. Kurtz. I.G. Farbenindustrie A.G., Leverkusen, Ger. Jun 1940. 6f (Text in German) Microfilm $1.25, Enlargement Print $2.50. PB 106325

1. Acrylonitrile - Preparation - Germany 2. Acrylonitrile - Polymers - Germany 3. KAUTEKO (Anwendungstechnische Kommission für Kautschuk) 4. Micro BIOS DOCS 2578/3306 5. Micro BIOS FD 1303/48, Frames 1-5.

English abstract included. Abstract available as PB 106325s. 1p. Microfilm $1.25, Photostat $1.25. Paper submitted to Kauteko (Scientific Rubber Committee) June 15, 1940.

INFRARED SPECTRA OF FLUORINATED HYDROCARBONS, by D. C. Smith, Morris Alpert, R. A. Saunders, George M. Brown, and Norma B. Moran. U. S. Naval Research Laboratory. Feb 1952. 90p graphs, tables (several fold) Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $2.25. PB 106319

New infrared data for fifty-five compounds have been obtained with prism spectrometers covering the 2-38 micron range. For fourteen compounds (CF_2 = CHCl, fluorobenzene, and twelve ethane derivatives), fundamental frequency assignments have been made, and interpretations have been presented for nearly all bands in the infrared and available Raman spectra. Thermodynamic functions have also been computed for eight of the ethane derivatives. Continuation of NRL R 3567 (PB 110324). NRI R 3924.

NITRAMINES, TRANSLATED BY HERMAN STONE, by H. J. Backer. Dec 1950. 123p Microfilm $5.00, Photostat $16.25. PB 106388

1. Nitramines - Germany.

Translated from Sammlung Chem. und Chem. Tech. Vorträge, v. 18, p. 359-474 (1912).

OPTICAL ABSORPTION OF SULFUR, by A. M. Bass. Massachusetts Institute of Technology. Laboratory for Insulation Research, Cambridge, Mass. Jan 1952. 12p diagrs, graphs, tables Microfilm $1.75, Photostat $2.50. PB 106300

The optical absorption of sulfur has been studied in the vapor and liquid state and in solution. These measurements indicate the presence of S_8 ring molecules which disappear at high temperature. The absorption edge in the liquid shifts at the rate of 6.20A/°C toward longer wavelengths with increasing temperature. It is believed that this displacement is related to the thermal excitation of the vibration levels of the sulfur molecules. ONR Contract N5ori-07801, NR-074-041. MIT LIR TR 50.

PROCESSING OF PHOSPHATES AT I. G. FARBENINDUSTRIE, A. G., BITTERFELD. I. G. Farbenindustrie A. G., Bitterfeld. Oct-Dec 1945. 47f drawings (Text in German) Microfilm $2.50, Enlargement Print $7.50. PB 106326

1. Phosphates - Production - Germany 2. Tricresyl phosphate - Production - Germany 3. Triphenyl phosphate - Production - Germany 4. Isobutyl phosphate - Production - Germany 5. Ethyl phosphate - Production - Germany 6. Micro BIOS DOCS 1901/569/6 7. Micro BIOS FR 696 8. Micro BIOS FD 3207/46, Frames 1-27.

English abstract included.

REDUCTION OF ACID CHLORIDES WITH GRIGNARD REAGENTS, by J. Sam Whitaker. Feb 1950. 86f Microfilm $3.75, Enlargement Print $12.50. PB 106386

1. Chlorides - Reactions 2. Alcohols - Preparation 3. Grignard reaction.

Thesis-Pennsylvania State College. Michigan University Publication no. 268.

RESULTS OF THE THIRD ANNUAL EXAMINATION OF SET, IMPREGNATING, FIELD, M_2, SUBJECTED TO OUTDOOR SURVEILLANCE, by Milton A. Raun. U. S. Chemical Corps. Chemical and Radiological Laboratories, Army Chemical Center, Maryland. Mar 1952. 9p Microfilm $1.25, Photostat $1.25. PB 106346

1. M_2 (Impregnating set) 2. Impregnating sets - Tests 3. CC CRL IR110.

Project no. 4-91-06-001, Interim report.

SYNTHESE DES ∝ (3,4-DIMETHOXYPHENYL)-GLYCERINS (SYNTHESIS OF ∝ -(3,4-DIMETHOXYPHENYL)-GLYCERINE), by Erich Adler and Karl Johan Björkqvist. Svenska Träforskningsinstitutet. Träkemi och Pappersteknik. 1951. 12p graph (Text in German) Microfilm $1.75, Photostat $2.50. PB 106513

1. ∝-Glycerine(3,4-Dimethoxyphenyl) - Sweden 2. Glycerine - Synthesis - Sweden 3. Svenska Träforskningsinstitutet. Träkemi och Pappersteknik. Meddelande 72.

Reprinted from Acta Chemica Scandinavica 5 (1951) p. 241-252.

ZUR QUANTITATIVEN BESTIMMUNG VON GLYCERINE, ATHYLENGLYKOL UND 1,2-PROPYLENGLYKOL NEBENEINANDER (ON THE QUANTITATIVE DETERMINATION OF GLYCERIN, ETHYLENE GLYCOL, AND 1.2-PROPYLENE GLYCOL SIDE BY SIDE) TRANSLATED BY WERNER A. POHLE, EDITED BY F. A. RAVEN, by G. Hoepe and W. D. Treadwell. Dec 1951. 14p Microfilm $1.75, Photostat $2.50. PB 106241

1. Glycerine - Detection - Switzerland 2. Ethylene glycol - Detection - Switzerland 3. 1,2-Propanediol - Detection - Switzerland 4. NAVSHIPS T446 5. STS 123.

From Helvetica chimica acta, vol. 25, pt, I, 1942, p. 353-361.

ELECTRICAL MACHINERY, EQUIPMENT AND SUPPLIES

Communication Equipment

BESCHREIBUNG DER 1000 KW-LANGSTWELLEN-SENDERANLAGE (DESCRIPTION OF THE 1000 KW LONGEST WAVE SENDING STATION AT CALBE/MILDE, GERMANY) TRANSLATED by F. S. Rizzo. Lorenz, C., A. G., Berlin. Oct 1951. 12p Microfilm $1.75, Photostat $2.50. PB 106343

1. Transmission systems - Germany 2. Radio transmitters - Germany 3. Facsimile equipment - Transmitters - Germany 4. Telegraph transmitters - Germany 5. NAVSHIPS T451.

From Lorenz Technical bulletin Oct 13, 1945.

COMPARISON OF PREDICTIONS OF ATMOSPHERIC RADIO NOISE WITH OBSERVED NOISE LEVELS, by E. L. Shultz. U. S. National Bureau of Standards. Central Radio Propagation Laboratory. Feb 1948. 7p map, diagrs, graphs Microfilm $1.25, Photostat $1.25. PB 106264

Two years' data from 16 atmospheric radio-noise measurement stations show sufficient consistencies in the relationship of the noise level and the geographic location of the observing station to indicate that a linear latitude trend approaches a definition of that relationship. The data on 2.5 and 5 Mc during night hours show a fair agreement with the United States Army Signal Corps predictions (RPU-140). An even closer agreement exists between the observed data and a linear latitude relationship for each frequency. The average noise level for the northern hemisphere exhibits a variation, seasonal sine wave with an amplitude of about three units, superposed on a general decreasing trend for the past two years at the rate of about four units per year. Presented at Joint meeting of the URSI and IRE, Washington, May 6, 1947. Reprinted from Transactions, American Geophysical Union, v. 28, no. 6, p. 854, Dec 1947. CRPL 1-5.

STUDY OF NAVY RADIO RECEIVERS IN A TROPICAL CLIMATE, by K. G. Williams and C. T. Lempke. U. S. Naval Research Laboratory. Feb 1952. 25p graphs, tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. Mimeo: $.75. PB 106322

A critical evaluation of a current moisture- and fungus-proofing treatment for electronic equipment was undertaken by exposing a number of Navy communications receivers of varying quality levels, coated and uncoated in a Panamanian jungle. The observations, spaning over almost four years, included periodic measurements of sensitivity as well as inspection for visual evidence of deterioration. None of the equipments studied are capable of giving prolonged, dependable service under the tropical conditions encountered. No evidence was developed, however, to indicate that treatment with fungicidal varnish prolonged the life or increased the reliability of the treatment equipments. Numerous observations pertinent to present practices in equipment design and material selection are presented. NRL R3935.

TELEPHONE RESEARCH AT THE SIEMENS-HALSKE WORKS ON NOISE IN SWITCHING EQUIPMENT, VOICE FREQUENCY DIALING, AND SOUND-POWERED SYSTEMS, by Frank C. Chevalier. Joint Intelligence Objectives Agency. Oct 1951. 44p drawings, diagrs, graphs, tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $1.25. PB 106269

Three reports on research conducted at the Siemens-Halske Works, in Germany, are presented. The first one deals with the causes of noise generated in the switching installation of the telephone central office. The second paper is a report prepared by the technical staff of Siemens-Halske on voice-frequency dialing. A detailed description is made of a system conforming with the recommendations of the CCIF for a uniform system of signals which would make cooperation possible between the systems installed in various countries. The third paper concerns sound-powered telephone systems. Contents: Pt. I. Causes of noise generated in telephone central office switching equipment, by M. Langer (Reprinted from Telegraphen-, Fernsprech-, Funk- und Fernseh-technik, no. 2, 1941). - Pt. II. Voice frequency dialing of Siemens-Halske in compliance with recommendations of the CCIF. - Pt. III. Notes on sound-powered telephone systems, by Panzerbieter Dec 1946. FIAT FR 1316.

Electronics

AUTOMATIC CONTROL OF TEMPERATURE AS A FUNCTION OF TIME USING MODULATED CURRENT BY P. J. ELSEY AND L. DALE HARRIS, AND AN ELECTRONIC AC VOLTAGE REGULATOR CIRCUIT, by L. Dale Harris. Utah. Engineering Experiment Station. Dept. of Electrical Engineering. Jun 1945. 18p drawings, diagrs, graphs, table Available from The Director, Utah Engineering Experiment Station, University of Utah, Salt Lake City, Utah. PB 106045

1. Temperature - Controls, Automatic 2. Circuits, Electronic 3. Voltage - Regulation 4. UU EES B28.

Bulletin of the University of Utah vol. 35, no. 25.

DIELECTRIC COVERED ANTENNAS. Pennsylvania State College. School of Chemistry and Physics. Wind Tunnel Laboratory. Jan 1946. 22p diagrs, graphs, tables Microfilm $2.00, Photostat $3.75. PB 106288

The purpose of this work is to study the effect of a dielectric cover on the radiation resistance and resonance length of Antennas. The materials selected for the covers were thermoplastics of fairly low loss and dielectric constant ranging from 2.5 to 22.5. These were molded over wires 1/8" diameter x 5 inches long to make the experimental antennas. A definite reduction in resonant length was obtained accompained with a reduction in the resistive component of the antenna. Contract no. W33-038-ac-7677. Report no. WFW-42.

INDEX LIST OF DIRECTIONAL COUPLERS, by J. W. Severinghaus. Massachusetts Institute of Technology. Radiation Laboratory. n.d. 13p drawings Microfilm $1.75, Photostat $2.50. PB 106267

1. Couplers, Directional 2. MIT Rad Lab 55-2/13/45.

INVESTIGATION OF SPECIFICATION JAN-C-81, SUBMITTED by Emanuel Gikow. U. S. Signal Corps Engineering Laboratories, Fort Monmouth, N. J. Oct 1951. 111p photos, graphs, tables Microfilm $4.75, Photostat $15.00. PB 106310

1. Capacitors, Ceramic variable - Specifications 2. SCEL TM M-1409 3. JAN-C-81.

Report prepared by Albert Lunchick. Signal Corps Proj. no. 4312A. Dept. of the Army Proj. no. 3-72-01-000. D. A. no. 7-32-01000. Project no. 4312A.

MAKING AND SEALING SYNTHETIC SAPPHIRE WINDOWS TO INFRARED DETECTING CELLS, by Neil F. Beardsley and George Greene, U. S. Air Materiel Command. Electronic Subdivision. Aircraft Radiation Laboratory, Wright-Patterson Air Force Base, Dayton, Ohio. Sep 1950. 15p drawing, graphs, tables Microfilm $1.75, Photostat $2.50. PB 106263

A set of techniques is described for grinding and polishing disks cut from boules of synthetic sapphire. The techniques for sealing these "windows" to pyrex envelopes for infrared detector cells are also given. Contract no. W33-038-ac-15160 in cooperation with Syracuse University. AAF TR 6495.

MEASUREMENT OF CONVERTER CRYSTAL PARAMETERS AND OVER-ALL NOISE FIGURES AT 10.7 CENTIMETERS, by W. J. Medd. National Research Council of Canada. Radio and Electrical Engineering Division. Nov 1951. 23p diagrs, graphs Available from National Research Council of Canada, Ottawa, Canada. $.15. PB 106248

Apparatus and experimental procedures are described for the determination at 10.7 centimeters of conversion loss, L, and noise temperature, t, of converter crystals, and of the noise figure of the intermediate frequency amplifier. An over-all noise figure is thus obtained from the formula $F_r = L(F_{if} + t - 1)$. This compared with an independent determination of F_r using a fluorescent lamp mounted across the wave guide as a source of radio-frequency noise power. NRCC ERA-208, NRCC 2568.

MEASURING THE SHIELDING EFFICIENCY OF SCREENED ENCLOSURES, by H. E. Dinger, and J. E. Raudenbush. U. S. Naval Research Laboratory. Nov 1951. 19p photos, drawings, diagrs, graphs, tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.50. PB 106317

A review has been made of shielded-enclosure methods employed to prevent interference or interaction between various types of electronic equipment. Studies of methods of measuring attenuation revealed the "door-open, door-closed" and "inside, outside" methods as having many disadvantages. A more reliable method employs a transmitter-loop assembly located outside and away from any large object which might reflect radio waves. After taking a series of field intensity measurements at various distances and angles from the assembly, the room was constructed around the transmitter-loop and measurements were taken at the same locations as before. The uniform-field method was chosen for reference purposes in this investigation because it was considered to be fundamentally sound and capable of rendering consistent results. Each room was, in turn, mounted on a flat-bed truck and transported to the sites of various high-power transmitting stations where suitable conditions might be found. Although there is possibility of disagreement over how the attenuations should be defined and measured, this method has the advantage of repeatability. However, it has the serious disadvantages of being very costly, time-consuming, and limited to rather small portable-type rooms, and is, therefore, not recommended for general use. Differences in shielding efficiency between a double-shielded room and a cell-type room are tabulated. A room without soldered seams and protected from the weather by a plywood roof and waterproof canvas sides showed some reduction of shielding effectiveness after remaining outside for a year. After tightening all loose bolts, the attenuation was almost the same as at the beginning of the year. A transfer-impedance method of evaluating shielded enclosures has been evolved at this Laboratory. Although the results are not directly obtainable in decibels of attenuation, and like all other methods it is not readily adaptable to vhf and higher frequencies, it does have the following advantages; relatively low-power oscillators can be used in place of more powerful transmitter-antenna combinations; the sensitivity is adequate for evaluating well-shielded rooms; measurements are easily standardized and specified; and there are no interfering signals produced at distance remote from the room. NRL R 3908.

RECOMMENDATIONS ON DESIGNING ELECTRONICS EQUIPMENT FOR THE JOB OF MAINTENANCE by Robert B. Miller and John D. Folley, Jr. U. S. Air Training Command. Human Resources Research Center. Technical Training Research Laboratory, Chanute Air Force Base, Illinois. Dec 1951. 22p diagrs Microfilm $2.00, Photostat $3.75. PB 106548

1. Electronic equipment - Design 2. Electronic equipment - Maintenance and repair 3. AAF HRRC RB 51-33.

Project no. 507-008-0001; Contract no. AF 33(038)-12921.

TRANSIENT PHENOMENA IN WAVEGUIDES, by Manuel Cerrillo. Massachusetts Institute of Technology. Research Laboratory of Electronics. Jan 1948. 202p drawings, diagrs, tables Microfilm $7.50, Photostat $26.25. PB 106311

This work deals with the study of the transient phenomena of electromagnetic waves in hollow metallic cylinders of a general geometric cross section when excited under different initial and terminal conditions. A semi-infinite waveguide, the cross-sectional dimensions of which are small in comparison with its length, is excited at one end, taken as the origin, by an electromagnetic field of rather arbitrary waveform. The solution given here shows (a) the distortion of the waves in amplitude and frequency as they propagate along the waveguide; (b) the speeds, signal and group velocities, and the time of formation (time in which the internal fields build up) at the given point of observation, or the spatial distribution of the fields at a given instant of time; (c) general signals; (d) reduction of all transients to a typical one by means of generating functions. Exact, asymptotic, and graphical solutions are given

as solutions of the transient behavior, and applications are made to some typical cases. To accomplish the above results, it was necessary to give a detailed and complete discussion of the motion of electromagnetic waves in systems of cylindrical configurations and the new results were obtained in this connection. Laplace transformations are used as the basic mathematical tool in this investigation. Slight modification of Thesis - Massachusetts Institute of Technology, June 1947. MIT RLE TR 33.

ÜBER DIE THEORIE DER ERDVERLUSTE VON ANTENNEN (ON THE THEORY OF GROUND LOSSES OF ANTENNAS) TRANSLATED BY WERNER A. POHLE, EDITED BY MARGARET W. RAVEN, by H. Brückmann. Jan 1952. 35p diagrs, graphs, tables Microfilm $2.25, Photostat $5.00. PB 106242

1. Germany. Forschungsanstalt der Deutschen Reichspost 2. Germany. Reichspost ministerium 3. Antennas - Ground systems - Germany 4. NAVSHIPS T447 5. STS 122.

Report of the Research Institute of the German Postal Service and of the Postal Service Headquarters in T.F.T. vol. 27, no. 2, 1938, p. 29-38.

UHF FILTERING NETWORKS. FINAL REPORT OF TECHNICAL PROGRESS SUBMITTED TO WATSON LABORATORIES UNDER CONTRACT NO. W28-099-AC-128, by Douglas E. Mode. Lehigh University. Electrical Engineering Dept., Bethlehem, Pa. Jul 1949. 43p diagrs, graphs Microfilm $2.50, Photostat $6.25. PB 106224

Research conducted in the development of filtering networks for application in uhf bands is reviewed. Five different types of filters are being considered, namely, the unsymmetrical low-pass and band-pass filters, the symmetrical low-pass or band-elimination filter, the coupled line band-pass filter, and the unsymmetrical band-elimination filter. Low-pass and band-pass filters having continuously adjustable cutoffs have been designed, built, and tested. The impedance of small leads in filters and the fringing effects at discontinuities have been studied. Cases of spurious mode transmission have been recognized and equations describing the frequency limits of such spurious transmission developed. It is pointed out that the research has not only contributed to ultrahigh-frequency filter design, but has also resulted in development of importance in other uhf work.

Generators, Motors, Transmission Distribution, and Allied Equipment

SELENIUM RECTIFIERS, HIGH-VOLTAGE PLATE. FINAL REPORT, 1 JUNE 1950 TO 31 MAY 1951, UNDER CONTRACT NO. DA-36-039-SC-107, by Frank J. Steinebrey. International Rectifier Corporation, Los Angeles, Calif. 1951. 78p photos, diagrs, graphs, tables (4 fold) Microfilm $3.50, Photostat $10.00. PB 106312

This report describes the work performed and the conclusions drawn in pursuance of contract number DA-36-039 SC-107. It includes descriptions of the experimental preparation of selenium rectifier cells for high voltage operation and furnishes detailed production methods for 40 volt cells in the sizes stipulated in the contract. While it was possible to produce the 40 volt cells in quantity, only a limited number of 60 volt cells have been formed due to difficulty of reproducibility by the present methods. During the contract period three selenium coating methods were studied; the pressed powder method, the molten applied method, and the double layer (molten and compressed powder) method. The pressed powder method proved most suited to the manufacture of 40 volt cells due to the excellent forward conductivity, uniformity, and economy in the use of selenium. The double layer method was required when making 60 volt cells to avoid break-down during forming. Pressing and annealing were studied under a variety of conditions. A large number of artificial barrier layer experiments were conducted using inorganic and organic materials. It was found possible to apply one barrier treatment over another, thereby obtaining blocking layers of very high voltage rating. The use of an amine-saturated oil treatment prior to electro-forming was used for production of cells with 40 volt reverse voltage rating. Methods of testing and the results obtained are included. Tests show that 40 and 60 volt cells have satisfactory electrical characteristics and are capable of operation up to 85°C. ambient for extended periods. Dept. of the Army project: 3-26-00-602. Signal Corps project: 32-2006-3.

Miscellaneous

ANALYSIS OF CONDUCTOR VIBRATION FIELD DATA, by R. F. Steidel, Jr. and M. B. Elton. Oregon Engineering Experiment Station, Corvallis, Oregon. 1951. 24p photos, diagr, graphs Available from Engineering Experiment Station, Oregon State College, Corvallis, Oregon. PB 106301

This paper presents a method of analyzing conductor vibration field data unique in that this method attempts to establish conductor vibration as a predictable quantity. This method should have merit in determining the vibration protection necessary for overhead conductors. The authors also feel that this method of field analysis has greater potentialities than those generally used by many operating utilities and will be useful in correlating field results with laboratory research data. A brief description is given of the present general practice of taking field measurements of vibration, chart analysis and the determination of corrective measures, and how this material is to be used. Paper recommended by the AIEE Transmission and Distribution Committee for presentation at the Pacific general meeting Aug 23, 1951, at Portland, Oregon. Reprint no. 38.

AB — we don't keep these series.

BASIC STUDY OF SPECIAL COLD CATHODE DISCHARGE TUBES FOR COUNTING AND SWITCHING APPLICATIONS. PROGRESS REPORT NO. 17 (FINAL REPORT) UNDER CONTRACT W36-039-SC-44589, by J. F. Heney and M. W. Wallace. Federal Telecommunication Laboratories, Inc., Nutley, N. J. Jan 1951. 104p photos, drawings (part fold) diagrs, graphs Microfilm $4.50, Photostat $13.75. PB 106178

1. Vacuum tubes, Cold cathode 2. Vacuum tubes, Cold cathode - Design 3. SIG Contract W-36-039-sc-44589, Final report.

Dept. of the Army project no. 3-19-02-032. Signal Corps project no. 27-313B-1.

BASIC STUDY OF SPECIAL COLD CATHODE DISCHARGE TUBES FOR COUNTING AND SWITCHING APPLICATIONS. ADDENDUM TO FINAL REPORT UNDER CONTRACT W36-039-SC-44589, by J. F. Heney and M. W. Wallace. Federal Telecommunication Laboratories, Inc., Nutley, N. J. Apr 1951. 12p drawings (2 fold) Microfilm $1.75, Photostat $2.50. PB 106178s

1. Vacuum tubes, Cold cathode 2. Vacuum tubes, Cold cathode - Design 3. SIG Contract W-36-039-sc-44589, Final report, Addendum.

Dept. of the Army project no. 3-19-02-032. Signal Corps project no. 27-313B-1.

BERICHT DES OPR DIPL. ENGR. EPPEN ÜBER DIE DIENSTREISE NACH CALBE/MILDE, GERMANY, JUN 8-11, 1943 (REPORT OF OFFICIAL TRIP TO CALBE/MILDE, GERMANY) TRANSLATED BY F. RIZZO, by Dr. Eppen. Jan 1952. 4p table Microfilm $1.25, Photostat $1.25. PB 106243

1. Transmission lines, High voltage - Germany 2. Transmission lines - Measurements - Germany 3. NAVSHIPS T449.

CONSTRUCTIONAL DRAWINGS OF ELECTRIC BRAKE AND SIGNALLING EQUIPMENT FOR RAILWAYS. PART I. Vereinigte Eisenbahn-Signalwerke G.m.b.H., Berlin. 1925-1946. 654f drawings (Legends in German) Microfilm $9.00, Enlargement Print $86.25. PB 106065

1. Brakes, Electric - Design - Germany 2. Signalling devices - Design - Germany 3. Railroads - Equipment - Design - Germany 4. Micro BIOS FD 398/51, Frames 1-573.

For Pt. 2 see PB 106066. English abstract included. Abstract available as PB 106065s. 2p. Microfilm $1.25, Photostat $1.25. Some frames will not reproduce well. See also BIOS FR 1167.

HOCHSPANNUNGSPROBLEME BEI GROSSENDER-ANTENNEN (HIGH POTENTIAL PROBLEMS IN LARGE-TRANSMISSION ANTENNAS) TRANSLATED BY FRANK RIZZO, by W. Peters. Nov 1951. 10p photos, graphs Microfilm $1.25, Photostat $1.25. PB 106244

1. Transmission lines, High voltage - Germany 2. Antennas, Transmitting - Germany 3. NAVSHIPS T450.

From Electrotechnical journal, 64th year, no. 35-36, p. 485-7.

INTENSITIVITY OF INFRARED DETECTION USING TEMPERATURE SENSITIVE PHOSPHORS, by C. C. Klick and J. H. Schulman. U.S. Naval Research Laboratory. Jan 1952. 5p diagrs Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.25. PB 106321

The decrease in light output from a phosphor as the temperature is increased beyond a sufficiently high temperature may be used to indicate the temperature change produced by infrared radiation. The decrease in light output of the phosphor is thus a measure of the infrared energy. Separation of the light variation of the phosphor produced by the infrared light from the background luminescence was accomplished by chopping the infrared light at 10 cycles per second and amplifying the signal from the photomultiplier tube with a 10-cycle amplifier. The sensitivity of this method of infrared detection is limited by noise to less than that of other detectors by a factor of 10,000. NRL R 3930.

PROGRESS REPORT NO. X ON O.N.R. CONTRACTS N5ORI-07801 AND N5ORI-07858. Massachusetts Institute of Technology, Laboratory for Insulation Research. Nov 1951. 41p photos, diagrs, graphs Microfilm $2.50, Photostat $6.25. PB 106079

1. Dielectrics - Research 2. Spectroscopy, Dielectric 3. Crystallography, X-ray 4. Ferromagnetism - Research 5. Liquefiers, Gas 6. Kilns, Ceramic.

REGULATED POWER SUPPLY FOR THE RANGE 5 TO 7 KILOVOLTS, by R. S. Richards. National Research Council of Canada. Radio and Electrical Engineering Division. Dec 1951. 7p diagr, graphs Available from National Research Council of Canada, Ottawa, Canada. $.10. PB 106293

A power supply developing 5 to 7 kilovolts at loads up to 75 milliamperes is described. Regulation is to within 12 volts, from zero to full load. Ripple is less than 10 volts. The power supply was built for a large stroboscope designed for research in photosynthesis. With the exception of the filament transformer for the type-8020 tubes, which was specially wound, all components used were readily available. The regulator circuit is a modification of that described in NRC Report no. 1854 (ERA-156) PB 97121) which should be consulted for a detailed explanation. NRCC 2368. NRCC ERB-257.

THREE PHASE DIRECT ARC FURNACE FOR LABORATORY USE, by W. Martin Fassell, James P. Blackledge, J. Hugh Hamilton. Utah. Engineering Experiment Station, Salt Lake City, Utah. Apr 1951. 20p photos, drawings, diagrs, graphs, tables Available from The Director, Utah Engineering Experiment Station, University of Utah, Salt Lake City, Utah. PB 106048

This paper describes the design and construction of a small (3 kilogram) three phase direct arc furnace. Included is an analysis of electrical operation using the "induction motor circle diagram" device and report of preliminary tests on the production of alloy steel from converter slag by direct reduction. Bulletin of the University of Utah vol. 41, no. 4. UU EES B49.

FOOD AND KINDRED PRODUCTS

FACTORS AFFECTING HEAT RESISTANCE OF SPORES OF CLOSTRIDIUM BOTULINUM, by G. M. Dack and Hiroshi Sugiyama. U. S. Quartermaster Food and Container Institute. Report no. 12, 1 July 1949-30 Sep 1950. Jan 1951. 59p graphs, tables Microfilm $2.75, Photostat $7.50. PB 105959

1. Clostridium botulinum 2. Bacteria - Spores - Heat resistance 3. Chicago. University. Division of Biological Sciences. Food Research Institute 4. QMC FCI Contract W11-183-qm-8122, Report 12.

Termination report under Contract no. W11-183-qm-8122, Project no. 7-84-12-010.

Submitted as thesis, University of Chicago. For report no. 11 see PB 103018.

FOOD USES FOR COTTONSEED, BY W. W. MEINKE. A COOPERATIVE INVESTIGATION BY THE COTTON RESEARCH COMMITTEE OF TEXAS AND THE TEXAS ENGINEERING EXPERIMENT STATION. Texas. Engineering Experiment Station, College Station, Texas. Feb 1952. 14p tables Available from Texas Engineering Experiment Station, Texas A.&M. College, College Station, Texas. PB 106359
1. Cottonseed - Uses 2. TU EES RR 34.

FUEL VALUE OF INDIVIDUAL, COMBAT, IN-FLIGHT FOOD PACKET, IF-4, RANDOM PACKING VERSUS RESTRICTED PACKING, by G. T. Norton and H. C. Dyme. U. S. Air Force. Wright Air Development Center. Research Division. Aero-Medical Laboratory, Wright-Patterson Air Force Base, Dayton, Ohio. Nov 1951. 24p graph, tables Microfilm $2.00, Photostat $3.75. PB 106286
1. IF-4 (Food packet) 2. Food rations, In-flight 3. AAF TSEAA MR 696-119.

MEAT PACKAGING AND PROCESSING. REPORT OF A VISIT TO THE U.S.A. IN 1950 OF A PRODUCTIVITY TEAM REPRESENTING THE MEAT PACKAGING AND PROCESSING INDUSTRY. Anglo-American Council on Productivity. Jan 1951. 86p photos, map, drawings, graph, tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $1.00. PB 106415
1. Meat processing machinery 2. Meat, Processed - Manufacture 3. Meat, Canned - Processing.

PACKET FOODS. REPORT OF A VISIT TO THE U. S. A. IN 1951 OF A PRODUCTIVITY TEAM REPRESENTING THE BRITISH PACKET FOODS INDUSTRY. Anglo-American Council on Productivity. Dec 1951. 9p photos, map, diagrs, tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $1.15. PB 106436
1. Food - Packaging 2. Machines, Packaging 3. Food industry.

SLICED BACON. METHODS OF PROCESSING: CURING, DRYING, SMOKING, SLICING, INCLUDING PACKAGING. U. S. Office of Technical Services. Jan 1952. 8p Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. Mimeo: $.25. PB 106210
1. Bacon - Preservation 2. Bacon - Packaging 3. OTS IR 7457.

STUDY OF METHODS FOR CONTROLLING NON-ENZYMATIC BROWNING DURING POTATO DEHYDRATION AND STORAGE OF DEHYDRATED POTATOES, BY A. R. PATTON, R. E. CARLSEN, C. O. GUSS, H. A. DURHAM, GESTUR JOHNSON. U. S. QUARTERMASTER FOOD AND CONTAINER INSTITUTE. REPORT FOR PERIOD OCT 1950-SEP 1951, UNDER CONTRACT DA11-009-QM-1391. Sep 1951. 3p table Microfilm $1.25, Photostat $1.25. PB 106207
1. Potatoes, Dehydrated - Browning 2. Potatoes, Dehydrated - Storage 3. Colorado. Agricultural Experiment Station 4. QMC FCI Contract DA 11-009-qm-1391.

SURVIVAL RATION REQUIREMENTS, METABOLIC ASPECTS. II: RELATION OF SINGLE-CONSTITUENT DIETS TO FOOD AND WATER REQUIREMENTS UNDER TEMPERATE CONDITIONS, by R. F. Kline and H. C. Dyme. U. S. Air Force. Wright Air Development Center. Research Division. Aero-Medical Laboratory, Wright-Patterson Air Force Base, Dayton, Ohio. Nov 1951. 8p graphs Microfilm $1.25, Photostat $1.25. PB 106287
1. Food rations, Survival 2. Metabolism - Research 3. Food rations - Nutritive value 4. AAF TSEAA MR 696-120.

TYPE B-4 ELECTRICALLY HEATED FOOD-WARMING OVEN, by Joshua D. Chathan, Billy B. Guy, Harry C. Dyme. U. S. Air Force. Wright Air Development Center. Research Division. Aero-Medical Laboratory, Wright-Patterson Air Force Base, Dayton, Ohio. Nov 1951. 65p photos, drawings, graphs (2 fold) Microfilm $3.00, Photostat $8.75. PB 106284
1. B-4 (Food warming oven) 2. Containers, Food - Tests 3. Stoves, Electrical 4. Maxson food systems 5. Food rations, In-flight 6. APGC Proj 34936-5 7. AAF TSEAA MR 691-5B.
Includes Final report on operational suitability test of ovens, hot food, type B-4 (Project no. APGC/SAB/8-A) by Caswell Grave; and Final report on operational suitability of the Maxson food system (Project no. 34936-5) by Caswell Grave; also in PB 99081) and military specification: Oven, frozen food warming, type B-4.

FUELS AND LUBRICANTS

BONDING OF MOLYBDENUM DISULFIDE TO VARIOUS MATERIALS TO FORM A SOLID LUBRICATING FILM. I: BONDING MECHANISM, by Douglas Godfrey and Edmond E. Bisson. U. S. National Advisory Committee for Aeronautics. Feb 1952. 16p photos, tables Microfilm $1.75, Photostat $2.50. PB 106252

The use of molybdenum disulfide MoS_2 as a solid film lubricant in applications where designs or temperatures preclude liquid lubricants is dependent upon successful bonding of MoS_2 to the surface. An experimental investigation was conducted to determine the basic mechanism of bonding MoS_2 and extend application of the bonding to a variety of materials. When MoS_2 was applied to a surface as a mixture of MoS_2 powder and some liquid vehicles, the liquid vehicle decomposed and polymerized to a resin which bound the particles of MoS_2 together and to the surface to be lubricated. MoS_2 can be bonded by resin-forming viscous liquid vehicles, such as asphalt- and silicone-base varnishes, glycerine, ethylene glycol, polyglycol ether, and corn syrup to a variety of materials, such as steel, aluminum, brass, stainless steel, and glass. The reduction of Fe_2O_3, formed by preheating steel in air, to Fe_3O_4 by one of the liquid

vehicles (syrup) improves the frictional properties of the solid lubricating film. Rubbing of MoS_2 whether dusted, built-up, or bonded by a resin to a surface produced distinct preferred orientation. NACA TN 2628.

COAL. REPORT OF A PRODUCTIVITY TEAM REPRESENTING THE BRITISH COAL MINING INDUSTRY WHICH VISITED THE U. S. A. IN 1951. Anglo-American Council on Productivity. Dec 1951. 114p photos, map, drawings, diagrs, tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.90. PB 106435

1. Coal mines and mining 2. Coal mining machinery.

FLAME SPEEDS OF METHANE-AIR, PROPANE-AIR, AND ETHYLENE-AIR MIXTURES AT LOW INITIAL TEMPERATURES, by Gordon L. Dugger and Sheldon Heimel. U. S. National Advisory Committee for Aeronautics. Feb 1952. 25p drawings, graphs, tables Microfilm $2.00, Photostat $3.75. PB 106202

Flame speeds were determined for methane-air, propane-air, and ethylene-air mixtures at -73° C and for methane-air mixtures at -132° C. The data extend the curves of maximum flame speed against initial mixture temperature previously established for the range from room temperature to 344°C. Both a thermal and diffusion theory predicted the effect of low initial temperatures within approximately 20 percent, as was found previously for high initial temperatures. The low-temperature data also extended the linear correlations between maximum flame speed and calculated equilibrium active-radical concentrations, which were established by the reported high-temperature data. Flame speed was determined from the total area of the outside edge of the shadow of a nozzle flame. NACA TN 2624.

INVESTIGATION OF HYDROCARBON IGNITION, by Charles E. Frank and Angus U. Blackham, U. S. National Advisory Committee for Aeronautics. Jan 1952. 33p diagrs, graph, tables Microfilm $2.25, Photostat $5.00. PB 106182

Accurate spontaneous ignition temperatures were determined for over 50 pure organic compounds including paraffins, olefins, aromatic hydrocarbons, alcohols, ethers, and esters. The effects of a wide variety of additives and of eight selected metals on the spontaneous ignition temperatures of these compounds were observed. Results are correlated with chemical structure and with antiknock characteristics where known; the more fundamental aspects of the possible chain-breaking and chain-branching reactions involved are also considered. NACA TN 2549.

PROPERTIES OF JP-4 FUEL, by Fex M. Grey. U.S. Air Force. Wright Air Development Center. Power Plant Laboratory, Wright-Patterson Air Force Base, Dayton, Ohio. Jan 1952. 7p graphs Microfilm $1.25, Photostat $1.25. PB 106387

1. Fuels, Aviation - Properties 2. JP-4 (Fuel) 3. AAF TSEPP 531-534.

Serial no. WCNE-531-534.

HIGHWAYS AND BRIDGES

DEFLECTIONS, MOMENTS, AND REACTIVE PRESSURES FOR CONCRETE PAVEMENTS, by Gerald Pickett, Milton E. Raville, William C. Janes, Frank J. McCormick. Kansas. Engineering Experiment Station, Manhattan, Kansas. Oct 1951. 124p diagrs, graphs, tables (1 fold) Available from Engineering Experiment Station, Kansas State College, Manhattan, Kansas. PB 106345

1. Pavements, Concrete - Loads 2. Pavements, Concrete - Stresses 3. Concrete slabs - Loads 4. Mathematical equations and solutions 5. KEES B65.

In cooperation with the Portland Cement Association. Kansas State College bulletin vol. XXXV, no. 8.

DYNAMIC LOADING OF CONCRETE TEST SLABS. FINAL REPORT. U. S. Army. Corps of Engineers. Ohio River Division Laboratories. Rigid Pavement Laboratory, Mariemont, Ohio. Aug 1943. 56p photos, drawings, graphs, tables Available from Ohio River Division Laboratories, Mariemont, Ohio $1.00. PB 106533

The purpose of this investigation is to compare the effect of impact loads produced by the landing of heavy airplanes and equivalent static loads on concrete runways. A detailed description of the testing equipment is presented, together with photographs and diagrams to illustrate its use. The available results are given and are followed by a discussion and conclusions falling within the limitations of the tests. Wright Field slab tests. Prepared for Office of the Chief of Engineers, Airfields Branch, Engineering Division, Military Construction.

EFFECTS OF TRAFFIC WITH SMALL HIGH-PRESSURE TIRES ON ASPHALT PAVEMENTS. U. S. Waterways Experiment Station, Vicksburg, Miss. Jun 1950. 73p photos, drawings, graphs, tables Available from Director, Waterways Experiment Station, P. O. Box 631, Halls Ferry Road, Vicksburg, Miss. PB 106537

1. Pavements, Asphalt - Traffic tests 2. Tires, Aircraft - Effect on pavements 3. Airports - Pavements - Tests 4. WES TM 3-314.

Prepared for Office of the Chief of Engineers, Airfields Branch, Engineering Division, Military Construction.

INVESTIGATIONS OF PRESSURES AND DEFLECTIONS FOR FLEXIBLE PAVEMENTS. REPORT NO. 1: HOMOGENEOUS CLAYEYSILT TEST SECTION. U. S. Waterways Experiment Station, Vicksburg, Miss. Mar 1951. 310p Available from Director, Waterways Experiment Station, P. O. Box 631, Halls Ferry Road, Vicksburg, Miss. $2.00 .PB 106535

This investigation was confined to tests performed on a homogeneous soil mass. Stresses and deflections induced by static loads of 15,000, 30,000, 45,000, and 60,000 lb, simulating the effect of single and dual airplanes tires, were measured by means of pressure cells and deflection gages buried in the

test section. The pressure cells were placed so as to obtain measurements of stresses normal to horizontal, vertical, and diagonal planes at depths of 1, 2, 3, 4, and 5 ft. Also a few cells were placed to obtain stress measurements at depths of 6 and 7 ft. Vertical deflections were measured at depths of 1, 2, 3, 4, and 5 ft. Prepared for Office of the Chief of Engineers, Airfields Branch, Engineering Division, Military Construction. WES TM 3-323, pt. 1.

INVESTIGATIONS OF PRESSURES AND DEFLECTIONS FOR FLEXIBLE PAVEMENTS. REPORT NO. 2: PILOT TESTS ON NEW FOUR-GAGE CELL. U.S. Waterways Experiment Station, Vicksburg, Miss. Oct 1951. 34p photo, drawings, graphs Available from Director, Waterways Experiment Station, P. O. Box 631, Halls Ferry Road, Vicksburg, Miss. $1.00. PB 106536

This is the second in a series of reports on the study of stresses and strains produced in flexible airfield pavements by external loads. An improved type of cell was developed by the Instrumentation Branch of the Waterways Experiment Stations and "pilot tests" were conducted to determine the adequacy of these new cells for obtaining the desired stress measurements. Readings were made of both residual and induced stresses on various old- and new-type cells bedded in earth to compare their performance. The new-type cells were also bedded in sand and in crushed limestone to study methods of installation of the instruments in base materials. Findings are presented. Prepared for Office of the Chief of Engineers, Airfields Branch, Engineering Division, Military Construction. WES TM 3-323, pt. 2.

JOINT, CRACK, AND UNDERSEALING MATERIALS, ANNOTATED by C. W. Lovell, Jr., Purdue University. Highway Research Board. Dec 1951. 24p Available from Highway Research Board, National Research Council, 2101 Constitution Ave., Washington 25, D. C. $.45. PB 106139

The problem of preventing the infiltration of water, silt, sand, and other materials into joints and cracks in concrete pavements has concerned highway engineers ever since such pavements first came into existence. Bibliography 12, which consists of 122 selected annotated references dating from 1912 to 1951, was designed to readily acquaint engineers with the information available. The references, obtained from a number of sources, are arranged chronologically. HRB B 12.

LOCKBOURNE NO. 2 EXPERIMENTAL MAT. FINAL REPORT. U. S. Army. Corps of Engineers. Ohio River Division Laboratory, Rigid Pavement Laboratory. Mariemont, Ohio. May 1950. 261p photos, drawings, graphs, tables Available from Ohio River Division Laboratories, Mariemont, Ohio. $2.00. PB 106551

1. Pavements, Concrete - Loads 2. Pavements, Concrete - Traffic tests 3. Airports - Pavements - Tests 4. Concrete - Impact tests.

Prepared for Office of the Chief of Engineers, Airfields Branch, Engineering Division, Military Construction.

LOCKBOURNE NO. 2 MODIFICATION MULTIPLE WHEEL STUDY. U. S. Army. Corps of Engineers. Ohio River Division Laboratories. Rigid Pavement Laboratory, Mariemont, Ohio. Jun 1950. 216p Available from Ohio River Division Laboratories, Mariemont, Ohio. $2.00. PB 106552

1. Pavements, Concrete - Loads 2. Pavements, Concrete - Traffic tests 3. Airports - Pavements - Tests 4. Concrete - Impact tests.

Prepared for Office of the Chief of Engineers, Airfields Branch, Engineering Division, Military Construction.

LOCKBOURNE NO. 3 PAVEMENT OVERLAY INVESTIGATION. U. S. Army. Corps of Engineers. Ohio River Division Laboratories. Rigid Pavement Laboratory, Mariemont, Ohio. May 1951. 233p photos, drawings, graphs, tables Available from Ohio River Division Laboratories, Mariemont, Ohio. $2.00. PB 106534

The purpose of this investigation was to obtain data to aid in the formulation of criteria for the design of flexible pavements on a specially constructed concrete pavement on a relatively plastic subgrade. Prepared for Office of the Chief of Engineers, Airfields Branch, Engineering Division, Military Construction.

OM BROBAGARS STABILITET I VERTIKALPLANET (ON VERTICAL STABILITY OF BRIDGE ARCHES) by Sven G. Bergström. Sweden. Statens Kommittee för Byggnadsforskning. 1951. 190p graphs, tables (Text in Swedish) Microfilm $6.75, Photostat $23.75. PB 106546

1. Bridges - Construction - Sweden 2. Beams - Buckling - Sweden 3. Beams - Plastic deformation - Sweden 4. Bridges, Arched - Loads - Sweden 5. Sweden. Statens Kommittee för Byggnadsforskning. Meddelanden no. 19.

Summary in English.

STUDIES OF SLAB AND BEAM HIGHWAY BRIDGES. PART III: SMALL-SCALE TESTS OF SHEAR CONNECTORS AND COMPOSITE T-BEAMS, by Chester P. Siess, Ivan M. Viest, Nathan M. Newmark. Illinois. Engineering Experiment Station, Urbana, Illinois. Feb 1952. 132p photos, drawings, graphs, tables Available from Engineering Experiment Station, University of Illinois, Urbana, Ill. $1.00. PB 106540

Three types of tests of shear connectors for composite concrete and steel T-beam bridges are reported in this bulletin: (1) tests of push-out specimens, (2) static tests of composite T-beams, and (3) tests of composite T-beams in fatigue. All specimens tested were approximately one-quarter scale models. The push-out specimens were made with various types of rigid and flexible connectors; the T-beams were made with channel shear connectors only. The purpose of the push-out tests was primarily the selection of the particular types of connector most deserving of additional study. The static and fatigue tests of T-beams were planned primarily to study the action of composite beams with channel connectors. The fatigue tests also provided data regarding the strength characteristics of channel shear connectors. Most of the findings from these tests are only qualitative. The principal findings are three: (1) The shear connector

selected for more detailed studies was of the rolled steel channel type. (2) The behavior of the channel connector is similar to that of a dowel embedded in elastic medium. A large part of the load transmitted by this connector is concentrated on the channel flange welded to the top flange of the I-beam and only the remaining smaller part is carried by the connector web. (3) A shear connection made from several channel connectors, if properly designed, insures a practically complete interaction between the concrete slab and the steel beam of the composite T-beam. The tests are presented in detail in this bulletin. Wherever practicable, comparisons are made with theoretical calculations; a theory for composite beams with incomplete interaction presented in the Appendix was used for this purpose. University of Illinois bulletin vol. 49, no. 45. Report of an investigation conducted by the Engineering Experiment Station, University of Illinois in cooperation with Division of Highways, State of Illinois and Bureau of Public Roads, U. S. Dept. of Commerce. ILU EES B396.

SUBSURFACE DRAINAGE. Highway Research Board. 1951. 23p map, graph Available from Highway Research Board, National Research Council, 2101 Constitution Ave., N. W., Washington 25, D. C. $.45. PB 106385

1. Drainage, Subsurface 2. HRB Bul. 45.

Presented at the 30th annual meeting, 1951. Replies to questionnaire, tabulated by Philip Keene and Seward E. Horner.

INSTRUMENTS

COINCIDENCE METHOD APPLIED TO ION BEAM MEASUREMENT, by Stanley Fultz and M. L. Pool. U. S. National Advisory Committee for Aeronautics. Feb 1952. 13p diagrs, graphs Microfilm $1.75, Photostat $2.50. PB 106316

A coincidence Geiger counter system was constructed for the absolute measurement of the activity of radioactive substances made in a cyclotron. The average beam current in the cyclotron can be calculated from the number of disintegrations per second observed, the half-life of the radioactive substance, and the reaction cross section. NACA TN 2627.

ELECTRONIC CORRELATOR, by T. P. Cheatham, Jr. Massachusetts Institute of Technology. Research Laboratory of Electronics. Mar 1951. 89p diagrs, graphs, table Microfilm $3.75, Photostat $11.25. PB 106542

The role and application of correlation functions in the statistical theory of communication is described in terms of the important basic properties of autocorrelation and crosscorrelation functions. An electronic correlator constructed on the basis of (a) utilizing pulse-sampling techniques and (b) multiplication in time-amplitude coordinates is described in detail. General criticisms and suggestions for improvements, based on experience gained from the application of the correlator to several problems, are given to aid future developmental work. Some additional methods of computing correlation functions are outlined and discussed. The experimental application of the electronic correlator is illustrated by several studies that are, in general terms, concerned with the detection, analysis, or filtering of a desired signal in noise. Contract W36-039-sc-32037. MIT RLE TR 122.

METHODS OF MEASURING HUMIDITY AND TESTING HYGROMETERS, by Arnold Wexler and W. G. Brombacher. U. S. National Bureau of Standards. Sep 1951. 20p diagrs, tables Available from Superintendent of Documents, Government Printing Office, Washington 25, D. C. $.15. PB 106373

This paper is a review of methods for the measurement of the water-vapor content of air and other gases and for the production and control of atmospheres of known humidity for hygrometer testing and calibration and for general research. Among the hygrometric techniques discussed are psychrometry, mechanical hygrometry, dewpoint measurement, electric hygrometry, gravimetric hygrometry, thermal conductivity, index of refraction, pressure and volume measurements, and dielectric constant. Descriptions are given of suitable equipment for establishing desired humidities over a wide range of temperature. A list of 157 selected references pertaining to hygrometry is included. NBS C 512.

NEW SAMPLING TECHNIQUE FOR SMALL AIRBORNE PARTICULATES: PARTICLE SIZE DISTRIBUTION BY COMBINED USE OF LIGHT AND ELECTRON MICROSCOPE, by James D. Wilcox and W. R. Van Antwerp. U. S. Chemical Corps. Chemical and Radiological Laboratories, Army Chemical Center, Maryland. Feb 1952. 10p photo, drawings Microfilm $1.25, Photostat $1.25. PB 106337

1. Particles - Size - Measurement 2. Microscopes, Electron 3. CC CRL IR 70.

Project no. 4-12-10-001, Interim report.

PROJECT CIRRUS. OCCASIONAL REPORT NO. 30: A VORTEX WHISTLE, by Bernard Vonnegut. General Electric Co. Research Laboratory, Schenectady, N. Y. Nov 1951. 11p drawings, graphs Microfilm $1.75, Photostat $2.50. PB 106309

Simple whistles have been constructed that produce sound by the escape of a vortex from the open end of a tube. The whistle operates equally well on either air or water. When the frequency that is produced by the passage of either air or water is plotted against the volume rate of fluid flow, it is found that the frequency depends almost linearly on the rate of flow and that the number of cycles produced by the flow of a unit volume of air is nearly the same as that produced by the flow of a unit volume of water. Measurements have been made relating the frequency of the sound produced to different pressures of air applied to the whistle. First occasional report under Contract no. DA-36-039-sc-15345. Dept. of the Army project: 3-99-07-022. Signal Corps project: 24-172 B-O. GE RL 599.

RADIO-FREQUENCY MASS SPECTROMETER FOR UPPER AIR RESEARCH, by J. W. Townsend, Jr. U. S. Naval Research Laboratory. Jan 1952. 8p

photo, diagrs, graph Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.25. PB 106320

Electronic circuits have been designed for the Bennett type of radio-frequency mass spectrometer so that it may be used in an experiment devised to obtain the composition of the upper atmosphere. The rocket-borne spectrometer samples the spectrum between mass numbers 48 and 5 once per second with a resolution of one part in twenty-five. Data may be obtained between pressure limits of 8×10^{-4} mm Hg and 2×10^{-6} mm Hg, which corresponds to ambient pressures between 100 and 160 km respectively. The entire instrumentation weighs less than 50 pounds and occupies a total of 1.4 cubic feet. NRL R 3928.

SEARCH FOR NEW RESISTIVE MATERIALS FOR HIGH-STABILITY, HIGH-TEMPERATURE-OPERATING RESISTORS. FOURTH QUARTERLY INTERIM ENGINEERING REPORT, JULY 10, 1950-OCT 10, 1950, by E. R. Olson, A. E. Middleton, and L. R. Jackson. Battelle Memorial Institute, Columbus, Ohio. Oct 1950. 22p diagrs, graphs, tables Microfilm $2.00, Photostat $3.75. PB 101978s3

Contract AF 33(038)-8744. E. O. 111-75. For 1st-3d reports see PB 101978-101978s2.

SEARCH FOR NEW RESISTIVE MATERIALS FOR HIGH-STABILITY, HIGH-TEMPERATURE-OPERATING RESISTORS. FIFTH QUARTERLY INTERIM ENGINEERING REPORT, OCT 10, 1950-JAN 10, 1951, by E. R. Olson, A. E. Middleton, and L. R. Jackson. Battelle Memorial Institute, Columbus, Ohio. Jan 1951. 16p tables Microfilm $1.75, Photostat $2.50. PB 101978s4

For 1st-4th reports see PB 101978-101978s3.

SEARCH FOR NEW RESISTIVE MATERIALS FOR HIGH-STABILITY, HIGH-TEMPERATURE-OPERATING RESISTORS. SIXTH QUARTERLY INTERIM ENGINEERING REPORT, JAN 10, 1951-APR 10, 1951, by E. R. Olson, A. E. Middleton, and L. R. Jackson. Battelle Memorial Institute, Columbus, Ohio. Apr 1951. 25p diagr, graphs, tables Microfilm $2.00, Photostat $3.75. PB 101978s5

For 1st-5th reports see PB 101978-101978s4.

SELECTED GOVERNMENT RESEARCH REPORTS. GT. BRIT. MINISTRY OF SUPPLY. VOL. 5. SERVOMECHANISMS. 1951. 312p photos, drawings, diagrs, graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $13.00. PB 106307

1. Servomechanisms - Gt. Brit. 2. Servomechanisms - Design - Gt. Brit. 3. Nyquist relation (Voltage fluctuation) - Gt. Brit. 4. Graphic methods - Gt. Brit. 5. Mathematical equations and solutions - Gt. Brit. 6. Analyzers, Differential - Gt. Brit. 7. Computers - Correlation functions - Gt. Brit. 8. Counters, Electronic - Gt. Brit. 9. Amplifiers, Integrating - Design - Gt. Brit. 10. Velodyne (Integrating - Design - Gt. Brit.) 11. Servodyne (Hydraulic flying control) 12. Indicators, Fuel - Gt. Brit. 13. Recorders, Cathode ray - Gt. Brit. 14. Generators, Direct current - Gt. Brit. 15. Gt. Brit. Dept. of Scientific and Industrial Research. Technical Information and Documents Unit.

S. O. Code no. 47-166-5. Contents: Report no. 1. Interpretation and use of harmonic response diagrams (Nyquist diagrams) with particular reference to servomechanisms (based on Ministry of Supply servo report Jun 1943) by P. J. Daniell. - Report no. 2. Operational methods for servo system (based on Ministry of Supply servo report July 1944) by P. J. Daniell. - Report no. 3. Graphical method for the solution of algebraic equations of any degree and a modification of Dr. Porter's solution of the quartic (report no. 5) (based on R.R.D.E. research report June 1944) by C. Mack. - Report no. 4. Electromechanical differential analyser with velodyne integrators) based on T.R.E. report Nov 1945) by H. G. Hay. - Report no. 5. Method for evaluating the roots of quartic equations and its application in servomechanism theory (based on R.R.D.E. report Jul 1942) by A. Porter. - Report no. 6. Method for evaluating rapidly the roots of equations of fifth and sixth degree and a note on the solution of the cubic equation (based on R.R.D.E. research report Feb 1944) by C. Mack. - Report no. 7. Apparatus for the computation of serial correlations and its use in frequency analysis (based on R.R.D.E, research report Jan 1945) by E. S. Shire and S. K. Runcorn. - Report no. 8. New scale-of-ten counting circuit (based on R.R.D.E. research report Aug 1943) by S. M. Taylor. - Report no. 9. Quick response sense-detecting rectifier circuit (based on R.R.D.E. memorandum Nov 1944) by E. A. Johnson. - Report no. 10. The Velodyne (base on T. R. E. report Apr 1944) by F. C. Williams. Report no. 11. Aided laying systems using changing speed and position gear ratios (based on R.R.D.E. research report Oct 1944) by E. A. Johnson. - Report no. 12. Design of servomechanisms which are required to smooth as well as retransmit data (based on R.R.D.E. research report Nov 1944) by J. M. Robson. - Report no. 13. Presence of air in oil and its probable effect on the irreversibility of hydraulic transmission systems (based on R. A. E. tech. note Apr 1947) by D. Rendel and G. R. Allen. - Report no. 14. Tests on the "Servodyne" hydraulic flying control assister (based on R. A. E. tech. note Dec 1947) by F. W. Read. - Report no. 15. Automatic indicator for coloured fuels flowing in a pipeline (based on R.A.E. report Jan 1948) by J. Savage and M. Squires. - Report no. 16. Cathode ray tube magslip recorder (based on R.R.D.E. research report Aug 1945) by E. S. Copinger. - Report no. 17. Linearity of the voltage/speed characteristic of small D. C. generators (based on T.R.E. report Mar 1946) by G. Russell.

SERIAL BINARY DECODER, by K. N. Wulfsberg. U. S. Air Force. Electronics Research Division. Cambridge Research Center, Cambridge, Mass. Jan 1952. 15p diagrs, graphs Microfilm $1.75, Photostat $2.50. PB 106331

A relatively simple circuit for converting binary numbers, represented by voltage pulses in time sequence, to their d-c voltage equivalents can be designed around the Shannon decoder. This report discusses factors affecting the decoding accuracy and describes an experimental circuit for decoding an 8-digit number. AAF ERL E 4086.

STABILIZED ION GAUGE CONTROL UNIT, by P. A. Redhead. National Research Council of Canada. Radio and Electrical Engineering Division. Jan 1952. 6p photo, diagr, graph Available from National Research Council of Canada, Ottawa, Canada. $.10. PB 106296

An ion gauge control unit is described which is similar to the Distillation Products type HG-200 but is constructed from readily available components. The control unit is intended for use with the VG1A gauge but may be adapted for other types of triode ionization gauges. NRCC ERB-275. NRCC 2619.

SUI MOTI CONICI ROTAZIONALI (ON ROTATIONAL CONICAL FLOW), by Carlo Ferrari. Feb 1952. 12p diagrs Microfilm $1.75, Photostat $2.50. PB 106352

The author determines some general properties of isoenergetic rotational conical fields. For such fields, provided the physical parameters of the fluid flow are known on a conical reference surface Σ it being understood that they satisfy certain imposed conditions, it is shown how to construct the hodographs in the various meridional semiplanes, as the envelope of either the tangents to the hodographs or of the osculatory circles. Translated by R. H. Cramer from Onore di Modesto Panetti. Nov 1950. NACA TM 1333.

SUMMARY OF THE TECHNICAL MINUTES OF THE SIGNAL CORPS ENGINEERING LABORATORIES RADIAC SYMPOSIUM 14-16 SEP 1949: IONIZATION CHAMBER INSTRUMENTS AND TECHNIQUES. PREPARED BY PERSONNEL OF NUCLEONICS SECTION, APPLIED PHYSICS BRANCH (FORMERLY GENERAL ENGINEERING BRANCH) EVANS SIGNAL LABORATORY. APPROVED by Charles K. Shultes, symposium editor. U. S. Camp Evans Signal Laboratory, Belmar, N. J. Sep 1949. 133p photos, drawings, diagrs, graphs, tables Microfilm $5.50, Photostat $17.50. PB 106271

1. Ionization chambers - Apparatus 2. Instruments, Radiation detection 3. AN/PDR-T1 (Radiac training instrument) 4. X-rays - Measurement 5. Insulators - Research 6. Resistors - High frequency characteristics 7. Tubes, Electron - Design 8. Tubes, Electron - Performance.

Contents: Quartz fiber and other techniques with application to electrostatic radiac instruments, by Francis R. Shonka. - Design of ion chamber instruments including circuit design, by Robert W. Schede and John R. Mahoney. - Introduction of radiac training set AN/PDR-T1, by L. E. Rasmussen. - Roentgen and its measurement with standard chambers, by Lauriston S. Taylor. - Theory of cavity ionization chembers, by Harold O. Wyckoff. - Secondary Standard Chambers, by Harold F. Gibson. - Some remarks concerning dosage measurement, by G. Failla. - Results of calibration tests on Atomic Energy Commission instruments, by Frank H. Day. - Survey of recent research and development on high performance insulators as used or suggested for use in ion chamber instruments, by A. J. Warner. - Miniature pocket type ionization chamber instruments, by P. R. Bell. - Characteristics of high-migohm resistors in ion current measurements, by K. E. Biermaster. - Method of measuring high resistances, by Roland K. Abele. - Electrometer tube designs, by P. T. Weeks. - Some characteristics and operating performance of electrometer tubes, by Herbert F. Starke.

LUMBER AND WOOD PRODUCTS

VERATRYL ALCOHOL, DIVERATRYL ETHER, AND VERATRYL-ETHYL ETHER AS LIGNIN MODELS. TREATMENT OF SPRUCE LIGNIN WITH SULPHITE SOLUTIONS AT P_H 4-9. GROUP B IN LIGNIN, by Bengt O. Lindgren. Svenska Träforskningsinstitutet. Träkemi och Pappersteknik. 1951. 28p graphs, tables Microfilm $2.00, Photostat $3.75. PB 106514

1. Lignin - Chemistry - Sweden 2. Lignin - Sulfidation - Sweden 3. Veratryl alcohol - Sweden 4. Ether, Diveratryl - Sweden 5. Ether, Veratryl-ethyl - Sweden 6. Svenska Träforskningsinstitutet. Träkemi och Pappersteknik. Meddelande 73-75.

Reprinted from Acta Chemica Scandinavica 4 (1950) p. 1365-1374, 5(1951) p. 603-620.

MACHINERY

ANALYTICAL INVESTIGATION ON SOME THREE-DIMENSIONAL FLOW PROBLEMS IN TURBO-MACHINES, by Frank E. Marble and Irving Michelson. U. S. National Advisory Committee for Aeronautics. Mar 1952. 109p diagrs, graphs, tables Microfilm $4.50, Photostat $13.75. PB 106406

The flow of an incompressible inviscid fluid through a turbomachine with blade rows consisting of an infinite number of similar infinitely thin blades has been investigated theoretically in order to examine and describe the three-dimensional flow phenomena and to illustrate the methods of calculation developed. NACA TN 2614.

BIBLIOGRAPHY OF MOTION PICTURES AND FILM STRIPS: FOUNDRY PRACTICE (SUPPLEMENT). U. S. Office of Technical Services. Mar 1952. 12p Available from the Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. Mimeo: $.50. PB 105715s

1. OTS FB 1 supplement.

Supplement to PB 105715.

THE BRASS FOUNDRY. REPORT OF A VISIT TO THE U.S.A. IN 1950 OF A PRODUCTIVITY TEAM REPRESENTING THE BRITISH BRASSFOUNDING INDUSTRY. Anglo-American Council on Productivity. Aug 1951. 182p photos, drawings, tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $1.70. PB 106409

1. Foundry practice 2. Foundries - Machinery 3. Brass industry.

CHARACTERISTICS OF THE LIGHT WEIGHT HIGH-IMPACT SHOCK MACHINE, by R. W. Conrad. U. S.

Naval Research Laboratory. Jan 1952. 36p photos, drawing, graphs, tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $1.00. PB 106318

A study was made of the light weight shock machine to determine its characteristics when operated according to standard shock-test specifications. Concentrated loads were secured to both the standard 4A and shelf mounting plates and subjected to hammer drops, from heights ranging between 1 and 5 ft, delivered to the back, edge, and top. Load weights varied from a minimum of 57 lb (instrumentation only) to a maximum of 389 lb, and comprised a welded-base assembly and sections of steel plates. These were bolted to the mounting plates by four 3/4-in.-diameter bolts arranged in a rectangular pattern, and were spaced away from the plates by 2-in pedestals. Two directions of orientation were permitted by the rectangular bolt pattern on the 4A plate--with either the long bolting dimension vertical or the long bolting dimension horizontal. However, only one orientation was used with shelf-mounted loads. Instrumentation comprised an accelerometer, a velocity meter, and a multi-frequency reed gage located on the load, and a second accelerometer mounted in a remote position on the mounting plates. Adaptors were employed for positioning the pickups to measure the shock motions in the direction of hammer impact. Output signals were recorded photographically as a function of time by a multichannel cathode-ray oscillograph, and simultaneously by a paralleled Mirragraph system. Peak values of acceleration and velocity were measured on the load for the numerous variations in test parameters, and curves were prepared showing the relation of the peak values to the intensity of the hammer blow. It is shown that the peak velocities for a given test condition are approximately linearly related to the hammer-impact velocity. Peak accelerations evidenced a greater scatter of data and necessitated analysis in terms of averages. Values in the range of 500 g (1000-cps low-pass filter) were the maximum measured on the load as the result of a 5-ft hammer drop, and occurred during back blows to horizontally oriented loads on the 4A plate. Loads mounted on the shelf plate received the least severe shocks. Both peak acceleration and velocity data showed small scatter for duplicate blows, if the blows were taken in succession or if the load was not distributed between blows. However, if a test condition was repeated after intervening blows to other loads and arrangements, considerable variations of peak values often occurred. NRL R 3922.

ELECTRIC MOTOR CONTROL GEAR AND SMALL AIRBREAK SWITCHGEAR. REPORT OF A VISIT TO THE U.S.A. IN 1949 OF A PRODUCTIVITY TEAM REPRESENTING SECTIONS OF THE ELECTRICAL MANUFACTURING INDUSTRY. Anglo-American Council on Productivity. Sep 1950. 49p photos, map, drawings, graphs, tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.50. PB 106411

1. Electrical equipment - Manufacture 2. Motors, Electric - Starters 3. Switch gear.

INFLUENCE OF LUBRICANT VISCOSITY ON OPERATING TEMPERATURES OF 75-MILLIMETER-BORE CYLINDRICAL-ROLLER BEARING AT HIGH SPEEDS, by E. Fred Macks, William J. Anderson and Zolton N. Nemeth. U. S. National Advisory Committee for Aeronautics. Feb 1952. 47p diagrs, graphs, tables Microfilm $2.50, Photostat $6.25. PB 106329

Oil viscosity (five oils were used) was found to have a significant effect on bearing operating temperature. Minimum bearing temperatures result when a low viscosity, low viscosity-index oil is used. Minimum power rejection to the oil (at a constant bearing temperature) results when a low viscosity oil is introduced at high inlet temperatures. The cooling correlation previously developed was extended to include fully the effect of varying viscosity. It is therefore possible to predict either inner-race or outer-race bearing temperature from single curves regardless of whether speed, load, oil flow, oil inlet temperature, oil inlet viscosity, oil-jet diameter or any combination of these parameters is varied. NACA TN 2636.

INTERNAL COMBUSTION ENGINES. PARTS AND INSTRUCTION BOOKS: FAIRBANKS MORSE MODELS 38D5 1/4, 38C5, 38A8. U. S. Bureau of Ships. Jun 1945. 800f photos, drawings, graphs Microfilm $9.00, Enlargement Print $105.00. PB 106362

1. Engines, Internal combustion - Maintenance and repair 2. Engines, Internal Combustion - Parts 3. 38D5 1/4 (Engine) 4. 38C5 (Engine) 5. 38A8 (Engine) 6. Micro NAVSHIPS D6066.

INTERNAL COMBUSTION ENGINES. REPORT OF A VISIT TO THE U. S. A. IN 1949 OF A PRODUCTIVITY TEAM REPRESENTING THE INTERNAL COMBUSTION ENGINE INDUSTRY. Anglo-American Council on Productivity. Jun 1950. 89p photos, map, drawings, graph, tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.65. PB 106414

1. Engines, Internal combustion - Manufacture.

NEW PROCESSES FOR MACHINING AND GRINDING. REPORT BY PANEL ON NEW PROCESSES FOR MACHINING AND GRINDING OF THE MINERALS AND METALS ADVISORY BOARD. National Research Council. Division of Engineering and Industrial Research. Minerals and Metals Advisory Board. Feb 1952. 87p photo, drawings, graphs, tables Available from Minerals and Metals Advisory Board, National Research Council, 2101 Constitution Ave., N. W., Washington 25, D. C. PB 106341

The potential values of new processes for machining and grinding have been evaluated with the conservation of diamond bort being of special interest. Some of these new processes appear promising as methods for conserving diamond bort when grinding sintered carbides; and they appear to offer promise for forming and finishing other hard-to-machine materials besides carbides. The electromechanical and electro-chemical types of processes are limited to shaping and finishing electrically conducting bodies such as metals and carbides. Abrasive types of methods, including diamond wheel grinding and ultrasonics, are capable of cutting all hard materials. Eight specific important operations, where

new processes for machining and grinding may be needed, have been emphasized in this report. For each of these operations, at least one of the new processes appears to offer possibilities for satisfactorily doing the job; and for shaping and finishing dies, two of the processes are in commercial use. Most of the diamond bort is consumed in shaping, finishing, and sharpening cemented carbide tools, such as single point tools, milling cutters and dies. Except for shaping and finishing dies, none of the new processes are in actual commercial use; nor are there fully proven designs available for immediate use in manufacturing machines to meet a shop demand toward saving bort. However, there are machine designs available for practical evaluation of these processes and of the results of using them to shape or sharpen materials and tools. A limited number of machines is becoming available for practical evaluation. Before substantial savings of diamond bort can be realized, there must be thousands of commercially operable units based on one or more of the new processes. At the present state of development, some of the processes appear capable of using existing machine units without extensive modification. Most of the new processes considered are worthy of more intensified research and development, leading as rapidly as possible to large scale industrial testing. For essentially every application, it will be necessary to carry out performance tests under conditions of shop operation, not only on the new cutting machines, but also on the as-shaped or as-finished items. Concurrent with performance tests, research and development on machine improvements and on fundamentals should proceed in a more intensified manner. To assist in pointing out the direction of effort for making these new processes commercially available as soon as possible, four recommendations have been formulated. These recommendations are concerned with: (a) the military's activity; (b) industrial research and development; (c) an educational program; and (d) means of obtaining effective liaison and coordination. Report submitted to the Research and Development Board under Contract DA49-025-sc-83. Appendices may be published only with the express permission of the authors. Contents: Appendix I. Grinding requirements of carbide fabricators and users, by John C. Redmond and Ford C. Ritner. - Appendix II. Diamond bort supply problem, by Max N. Felker. - Appendix III. Performance of diamond wheel grinding, by H. W. Wagner. - Appendix IV. Forming of gas turbine engine blades fastenings, by John C. Redmond. - Appendix V. European activities on electro-processes for machining and grinding, by L. H. Metzger. - Appendix VI. - Electrolytic process for shaping metals and metal carbides, by George Keeleric, Howard T. Francis, Charles L. Faust. - Appendix VII. Electro-sparking process for shaping carbides, by Ian McKechnie and D. F. Dickey. - Appendix VIII. Ultrasonic grinding and machining of both metals and non-metals, by Arthur Kuris. - Appendix IX. Electro-erosive machinery of hard metals and carbides, by I. Weber and G. F. Nordblom.

NORMENMAPPE FÜR MARINEWAFFENGERÄT (PORTFOLIO OF STANDARDS FOR TOOLS FOR MARINE WEAPONS). Germany. Kriegsmarine. Dec 1945. 73f drawings, tables, (Text in German) Microfilm $3.50, Enlargement Print $11.25.
PB 106564

1. Tools - Standards - Germany.
Part of ONI, London Reel 21-1B.PG-7825-NID.

OPERATING CHARACTERISTICS OF THE CARVER 176-SAW LINTER, by Dick H. Piner, Jr. and A. Cecil Wamble. Texas. Engineering Experiment Station, College Station, Texas. Nov 1951. 10p photos, drawing, tables Available from Texas Engineering Experiment Station, College Station, Tex.
PB 106265

The optimum operating condition for the removal of lint from cottonseed depends upon many factors - both economical and technical. Experimentation with the 176-saw linter has brought study of some of these. The roll density was found to be the most important of the factors which influence capacity. The pounds of lint per linter per 24 hours increases 13.8 per cent, as the weight is increased from 3 1/8 pounds to 4 3/8 pounds. From the initial density weight of 3 1/8 pounds to 5 5/8 pounds, the over-all increase in pounds of lint per linter is 28.2 per cent. The saw projection is also important in improving capacity. By changing the projection from 7/8 inch to 1 1/8 inches, the pounds of lint per linter per 24 hours was increased 9.7 per cent. The upper limit to this increase in saw projection is probably the point at which excessive hulling of the seed is evident. The float to saw ratio is only mildly significant, but tends to increase the pounds of lint per linter per 24 hours as it is increased. However, an increase of only 10.1 per cent was obtained throughout the range tested - from 55.5 to 97.5 per cent. It is doubtful that the increase is worthwhile compared to the extra wear on the equipment and extra power consumed. A cooperative investigation by the Cotton Research Committee of Texas and Texas Engineering Experiment Station, College Station, Texas. TU EES RR 31.

PLANT LAYOUT TOOLS, PART I: PROGRESS - THE PLANNING AND EXECUTION OF SOUND LAYOUTS. U. S. Bureau of Ships. Jan 1952. 8p photos, tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.25.
PB 106323

1. Tools - Plants - Layout 2. Material handling - Equipment 3. Factories - Layout 4. NAVSHIPS IN 118.

VALVES, STEEL, IRON AND NON-FERROUS. REPORT OF A VISIT TO THE U.S.A. IN 1950 OF A PRODUCTIVITY TEAM REPRESENTING THE VALVE INDUSTRY. Anglo-American Council on Productivity. Jun 1951. 90p photos, map, drawings Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.90.
PB 106430

1. Valves - Manufacture.

WÄLZLAGER FÜR BAUMUSTER BMW 801 DER FA. STEYR (ROLLER BEARINGS, MANUFACTURED BY STEYR) FOR BMW 801 ENGINE), by Herr Lenk. Jun 1943. 4f graphs (Text in German) Microfilm $1.25, Enlargement Print $1.50.
PB 106389

1. BMW 801 (Engine) 2. Roller bearings - Tests - Germany 3. BMW EZV 661-43.

WELDING. REPORT OF A SPECIALIST TEAM WHICH VISITED THE U.S.A. IN 1950. Anglo-American Council on Productivity. Aug 1951. 98p photos, drawings, tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.90. PB 106431

1. Welding 2. Welding - Equipment.

MEDICAL RESEARCH AND PRACTICE

COMBINED EFFECTS OF ATROPINE, WORK AND HEAT ON HEART RATE AND SWEAT PRODUCTION IN MAN, BY F. N. CRAIG, W. V. BLEVINS, A. BULLIS, E. J. ESPOSITO, R. RILEY, WITH A STATISTICAL ANALYSIS by I. A. DeArmon, Jr. U. S. Chemical Corps. Medical Laboratories, Army Chemical Center, Maryland. Nov 1951. 30p graphs, tables Microfilm $2.00, Photostat $3.75. PB 106569

1. Atropine - Physiological effects 2. Body, Human - Temperature - Effect of atropine 3. Heart - Effect of atropine 4. CC MD RR 92.

Project no. 4-08-01-002.

EFFECT OF WHOLE BODY X-RADIATION AND OF INTRAPERITONEAL HYDROGEN PEROXIDE ON A NUCLEOPROTEIN-CONTAINING FRACTION OF RAT INTESTINE AND ON WHOLE RAT INTESTINE, by Robert N. Feinstein and Carrie L. Butler. U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas. Nov 1951. 6p Microfilm $1.25, Photostat $1.25. PB 106380

Whole body x-radiation of rats decreases the relative viscosity of alkaline blends of the intestine and decreases the percentage of the whole blend which forms tactoid. X-radiation decreases the amount of dry matter, nitrogen, and phosphorus found in the tactoid. The loss in phosphorus is derived from the nucleic acid fraction. X-radiation decreases the tactoid ash and tactoid ash aluminum to an extent that is of dubious statistical significance because of wide variation in control values. The ash sodium does decrease significantly. In one experiment, intraperitoneal H_2O_2 appeared significantly radiomimetic. In a second experiment this was not found true, despite the "statistical significance" of the first findings. Such erratic results of H_2O_2 have been noted before on different lots of laboratory animals. Work done under a research contract with U. S. Atomic Energy Commission.

FATIGUE AND BOREDOM IN REPETITIVE WORK, by S. Wyatt and J. N. Langdon (assisted by F.G.L. Stock). Gt. Brit. Medical Research Council. Industrial Health Research Board. 1937. Reprinted. 1951. 85p graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.50. PB 106366

1. Fatigue, Industrial - Gt. Brit. 2. Fatigue - Research - Gt. Brit. 3. MRC IHRB R77.

S. O. Code no. 46-2-77-51.

HUMAN EXPOSURES TO LINEAR DECELERATION. II: THE FORWARD-FACING POSITION AND THE DEVELOPMENT OF A CRASH HARNESS, by John Paul Stapp. U. S. Materiel Command. Engineering Division. Aero-Medical Laboratory, Wright Field, Dayton, Ohio. Dec 1951. 162p photos, drawings, graphs, tables Microfilm $6.25, Photostat $21.25. PB 106572

Fifty-three experiments are reported in which twelve healthy male human volunteers were exposed to linear decelerations at right angles to the long axis of the body. In fifty-one experiments the subject sta facing forward on the decelerator. For comparison the subject was seated facing backward in two cases. The range of deceleration from 10 g at 575 g per second rate of change of deceleration to 38.6 g at 1370 g per second was explored by a series of six deceleration configurations increasing by about 5 g increments. A second group of six runs provided a range of deceleration of 14.0 g at 281 g per second to 45.4 g at 493 g per second. Duration of deceleration ranged from .15 to .35 seconds for all experiments. Measurement of harness loading during deceleration by means of bonded strain gauge tensiometers attached to a symmetrical half of the harness allowed comparison of loadings for three harness configurations, and served as a check on accelerometer data in twenty-two experiments. The weight of the subject multiplied by the deceleration reading at the chest was compared with the total loading of the harness measured simultaneously by the tensiometers, with good agreement. The limited number of channels confined measurements during a run to physical factors, so that physiological and clinical data consisted of such measurements before and after runs as electrocardiogram, x-rays when indicated, ophthalmoscopic examination, testing of reflexes, urinalysis and dye excretion tests, pulse, respiration, temperature and blood pressure, and detailed interrogation for subjective data. USAF contract W-33-038-ac-1492. Part I is PB 100871. AAF TR 5915, pt. 2.

NERVOUS TEMPERAMENT, by Millais Culpin and May Smith. Gt. Brit. Medical Research Council. Industrial Health Research Board. 1930. Reprinted. 1951. 54p graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.15. PB 106365

1. Neuroses - Gt. Brit. 2. Psychology, Applied - Gt. Brit. 3. Nervous system - Pathology - Gt. Brit. 4. MRC IHRB R61.

NEUERE ERGEBNISSE DER EXPERIMENTELLEN CHEMOTHERAPIE DER TUBERKULOSE (EXPERIMENTAL CHEMOTHERAPY OF TUBERCULOSIS), by H. D. Vogilsang. 1947? 12p (Text in German) Microfilm $1.75, Photostat $2.50. PB 106525

1. Tuberculosis - Therapy - Germany 2. Chemotherapy - Germany 3. Chemotherapeutisches Forschungsinstitut "Georg Spayer-Hans", Frankfurt, Ger.

English abstract included.

NUCLEOPROTEIN-CONTAINING FRACTION OF INTESTINAL MUCOSA, by Robert N. Feinstein, and Carrie L. Butler. U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas. Nov 1951. 8p tables Microfilm $1.25, Photostat $1.25. PB 106379

A nucleoprotein-rich fraction has been obtained

from alkaline blends of intestinal mucosa by placing the blend in the cold with or without adjustment of the pH to 11. After several days (or week, if the pH is not previously adjusted), a two-phase liquid system becomes evident. The heavier, viscous, continually contracting phase, designated here as the tactoid, generally has a composition of approximately 50 percent nucleoprotein, 25 percent fat, and 25 percent ash. The nucleic acid appears to be almost entirely of the desoxypentose type. The ash contains appreciable amounts of aluminum, which may be of some significance in the formation of the tactoid. Work done under a research contract with U. S. Atomic Energy Commission.

REFERENCE ANTHROPOMETRY OF ARMY MEN, by Russell W. Newman and Robert M. White. U. S. Office of the Quartermaster General. Military Planning Division. Research and Development Branch. Sep 1951. 176p tables Microfilm $6.50, Photostat $22.50. PB 106361

1. Anthropometry 2. U. S. Army - Anthropometry 3. U. S. Climatic Research Laboratory, Lawrence, Mass. 4. QMC EPS 180.

SOME REMARKS ON THE MODERN STATUS OF AUDITORY THEORY, by Ernest Glen Weaver. Nov 1950. 16p graph Microfilm $1.75, Photostat $2.50. PB 106177

1. Auditory theory 2. Ear, Internal 3. Sound - Pitch.

Contract N6onr-270, T. O. 3 with Princeton University. Presented at the meeting of the Acoustical Society of America, Nov. 11, 1950.

STANDARD VALUES IN BLOOD, EDITED by Errett C. Albritton. American Institute of Biological Sciences. Committee on the Handbook of Biological Data. Jul 1951. 283p diagrs, graph, tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $5.25. PB 106553

The report presents in tabular form standard values in blood for man and other vertebrates. The values are arranged under the following sections: Physical Properties; Coagulation Phenomena; Blood Groups; Erythrocytes and Hemoglobin; Leukocytes; Blood and Bone Marrow Cells; Water, Carbohydrates, Lipids, and Proteins; Amino Acids and Non-Protein Nitrogen Compounds; Phosphorus and Sulfur Compounds; Vitamins, Hormones, and Enzymes; Electrolytes, Minerals, Gases, and Acid-Base Values; Effects of Radiation and Storage; Effective Blood Levels of Therapeutic Agents. The tables in this unusually complete collection of data on blood are unique in the high degree of reliability sought for the data. Data have been supplied and autheticated by over six hundred leading investigators in biology and clinical medicine. The tables have been exhaustively reviewed, some by as many as twenty experts in the field. The tables are also unique in their treatment of the well known phenomenon of biological variability. In addition to giving a single representative value for each item covered in a table, the tables present information on variability in a most easily comprehensible and directly usable form. The quantitative data are supplemented with essential information on nomenclature, units, methods and conditions of measurement, investigated strains, and theories. An extensive bibliography using a special reference system is appended which also contains the name of the contributor for each value. First part of a Handbook of biological data. AAF TR 6039.

STUDIES ON CUTANEOUS HEAT LOSSES. PART I: A METHOD OF PARTITIONAL CALORIMETRY OF INDIVIDUAL SKIN AREAS, by Alrick B. Hertzman, Walter C. Randall, Clarence N. Peiss, Helge E. Ederstrom, Russel Seckendorf. U. S. Air Force. Wright Air Development Center. Research Division. Aero-Medical Laboratory, Wright-Patterson Air Force Base, Dayton, Ohio. Nov 1951. 16p drawings, graph, tables Microfilm $1.75, Photostat $2.50. PB 106376

A method of partitional calorimetry which is applicable to the measurement of the radiative, convective and evaporative heat losses from a limited skin surface (forehead, palm, thigh, etc) was based on measurements of skin and environmental temperatures and cutaneous evaporative rates. Radiation was calculated from the Stefan-Boltzmann equation; convection was estimated from the air insulation which in turn was approximated from the application of the diffusion equation to the evaporation of water. The local evaporative rates were measured by means of desiccating capsules. The sources of error are described. The total body losses of heat via radiation and convection from the skin cannot be obtained from the sum of the weighted regional rates, For reasons given in the text, this is not a criticism of regional partitional calorimetry. Total cutaneous evaporation is closely approximated by the sum of the weighted regional rates. Contract AF 33(038)-8585 with St. Louis University. First of a series of eight reports. AAF TR 6680, Pt. 1.

SURVEY OF LIPIDS IN ARCTIC ANIMALS, by Charles G. Wilber and Xavier J. Musacchia. U. S. Air Force. Wright Air Development Center. Research Division. Aero-Medical Laboratory. Wright-Patterson Air Force Base, Dayton, Ohio. Apr 1951. 24p graph, tables Microfilm $2.00, Photostat $3.75. PB 106375

Lipid estimations were made of tissues from the following Arctic animals: tom cod, as amphipod, ground squirrel, jaeger, loon, snowy owl, and eider. The birds showed interesting similarity of lipid pattern from one Order to another. The tom cod tissues contained over 90 percent esterified cholesterol; this is appreciably higher than in tissues of homothermes. The amphipod had an extremely high phospholipid content. Lipids in starving ground squirrels are similar to those of hibernating ones. Cholesterol in the tissues of the former is greater than in the latter. Report prepared by St. Louis University on sub-contract no. AF33(038)-422-89049. AAF TR 6463.

METALS AND METAL PRODUCTS

ALUMINIUM AND ALUMINIUM ALLOYS IN BUILDING, PT. I. Gt. Brit. Dept. of Scientific and Industrial Research. Building Research Station, Watford,

England. Feb 1952. 8p tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.10. PB 106521

1. Aluminum - Use in building - Gt. Brit. 2. Aluminum alloys - Specifications - Gt. Brit. 3. DSIR BRD no. 39.

S. O. Code no. 72-22-0-39.

APPARATUS FOR RECORDING THE COMPRESSIVE STRESS-STRAIN CURVE FOR THIN MATERIAL COUPONS AT LARGE STRAINS, by B. Bergqvist. Flygtekniska Försöksanstalten (FFA) Stockholm. Jan 1951. 31p photos, diagrs, graphs, table Microfilm $2.25, Photostat $5.00. PB 106403

A method of determining the stress-strain curve of thin coupons, of such materials as aluminium alloys, has been developed at FFA. The method involves some new and interesting features which justifies the description given in this paper, although it is easy to point out certain improvements that are possible to be carried out. The apparatus employed consists mainly of a jig supporting the specimen against excess buckling. It has been designed in order to determine, in a rapid and accurate way, the stress-strain curve, and values of Poisson's ratio, corresponding to strains in the elasto-plastic region exceeding several times that at the 0.2% proof stress. At these large strains, however, frictional forces are developed between the specimen and jig, which to a considerable extent reduce the applied compressive stress on the specimen. Therefore, the apparatus has been provided with a device to record continuously these frictional forces. Regarding these and other disturbance factors, special tests have been performed showing sufficient reliability of the jig for the required accuracy of the stress-strain curve. Further, some typical test results obtained with this jig are presented. It should be pointed out, that recording the large strains involved would be much more difficult and inaccurate without the aid of wire resistance strain gauges of a new type developed at FFA. FFA no. 39.

CAVITATION DUE TO SURFACE ROUGHNESS, BY K. K. SHALNEV. TRANSLATED BY ROSE JERMAIN, EDITED by Margaret W. Raven. Nov 1951. 39p photos, diagrs, graphs, tables Microfilm $2.25, Photostat $5.00. PB 106238

1. Cavitation - Russia 2. Roughness, Surface - Russia 3. NAVSHIPS T442 4. STS 115.

From Journal of theoretical physics, vol. 21, no. 2, 1951, p. 206-220. Some photographs will not reproduce well. PB 106239 includes much of this paper.

CREEP IN METALS, by A. D. Schwope, F. R. Shober and L. R. Jackson. U. S. National Advisory Committee for Aeronautics. Feb 1952. 52p photos, diagrs, graphs, table Microfilm $2.75, Photostat $7.50. PB 106315

This report covers phases of an investigation of the fundamentals of creep in metals. Results of a study of creep in single crystals of high-purity aluminum are presented and discussed. It is shown that at low stresses the creep phenomenon appears to be consistent with Mott and Nabarro's theory of exhaustion creep while at higher stresses results appear to be more in accord with ideas expressed by Andrade. NACA TN 2618.

DIN VORNORM A 101,103-110,112,114-116,118,120-122,1201,1211-1213. Deutsche Ingenieur Normen. Feb 1933. 52f diagrs (Text in German) Microfilm $2.75, Enlargement Print $8.75. PB 106561

1. Steel - Specifications - Germany.

Part of ONI, London Reel 21-1B. PG-7108-NID.

DUST IN STEEL FOUNDRIES. SECOND REPORT OF A COMMITTEE APPOINTED TO CONSIDER METHODS OF PREVENTING THE PRODUCTION OR THE INHALATION OF DUST AND THE POSSIBILITY OF REDUCING THE USE OF MATERIALS CONTAINING FREE SILICA IN STEEL FOUNDRIES. Gt. Brit. Ministry of Labour and National Service. Factory Dept. Mar 1951. 98p photos, graphs, tables Available from the British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.90. PB106369

1. Dust particles - Measurements - Gt. Brit. 2. Dust removal - Gt. Brit. 3. Masks, Dust - Tests - Gt. Brit. 4. Linde burner - Gt. Brit.

S. O. Code no. 36-140-2. H. A. Hepburn, Chairman. Includes appendices: Appendix 1. Radiographic examination of steel foundry personnel, by British Steel Founders' Association. - Appendix 2. Photomicrographic scale for the estimation of dust samples, by W. A. Bloor and W. B. Lawrie. - Appendix 3. Dust survey in a foundry using a konimeter and an Owens jet dust counter, by W. A. Bloor and W. B. Lawrie. - Appendix 4. A survey of atmospheric dust concentrations in foundry, by W. A. Bloor and W. B. Lawrie. - Appendix 5. Summary of dust estimations in 33 foundries, by W. A. Bloor and W. B. Lawrie. - Appendix 6. Steel foundries dust survey, by J. W. Parsons. - Appendix 7. Work proceeding in conjunction with the Dust in Steel Foundries Committee. - Appendix 8. The Linde burner, by G. T. Hampton. - Appendix 9. Dust estimations at two steel foundry fettling benches provided with local exhaust ventilation, by W. A. Bloor and W. B. Lawrie. - Appendix 10. Dust extraction on swing grinders by English Steel Corporation, Ltd., by G. S. Cleghorn. - Appendix 11. Report of test on a steel dressing shop mask fitted with an "air curtain", by W. A. Bloor and W. A. Lawrie.

ELECTRIC STEEL INGOT PRACTICE FOR SEAMLESS TUBE MANUFACTURE, by Roy W. Tindula. U. S. Office of Technical Services. Jan 1952. 11p Available from the Office of Technical Services, U.S. Dept. of Commerce, Washington 25, D. C. Mimeo: $.50. PB 106027

1. Steel ingots - Pouring 2. Steel - Electric furnace process 3. Tubes, Seamless - Pouring.

FATIGUE STRENGTHS OF AIRCRAFT MATERIALS. AXIAL-LOAD FATIGUE TESTS ON NOTCHED SHEET SPECIMENS OF 24S-T3 AND 75S-T6 ALUMINUM ALLOYS AND OF SAE 4130 STEEL WITH STRESS-CONCENTRATION FACTOR OF 1.5, by H. J. Grover, W. S. Hyler and L. R. Jackson. U. S. National Advisory Committee for Aeronautics. Feb 1952. 22p diagr, graphs, tables Microfilm $2.00, Photostat $3.75. PB 105757

Results are given of axial-load fatigue tests on notched specimens of 24S-T3 and 75S-T6 aluminum alloys and of normalized SAE 4130 steel. Each specimen was notched by edge notches designed to have a theoretical stress-concentration factor of 1.5. Tests

were run at nominal mean stresses of 0, 10,000, 20,000, and 30,000 psi. Results extend previously reported data on unnotched specimens and specimens more severly notched afford data on the variation of fatigue strength reduction with notch severity. NACA TN 2639.

HOT DIP GALVANIZING OF GENERAL WORK. REPORT OF A VISIT TO THE U.S.A. IN 1950 OF A SPECIALIST TEAM REPRESENTING THE HOT DIP GALVANIZING INDUSTRY. Anglo-American Council on Productivity. Aug 1951. 79p photos, map, drawings Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.90.
PB 106413

1. Galvanizing.

KRIEGSMARINE NORMEN (MARINE STANDARDS). Germany. Kreigsmarine. Feb 1939-Sep 1943. 102f (Text in German) Microfilm $4.50, Enlargement Print $15.00. PB 106562

1. Steel - Specifications - Germany.

Part of ONI, London. Reel 21-1B. PG 7619-NID.

MARFORM. PART II: OPERATION, POSSIBILITIES AND LIMITATIONS OF THE PROCESS. U. S. Bureau of Ships. Dec 1951. 15p photos, drawings, tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.50.
PB 105800s

1. NAVSHIPS IN 117.

Reprint from "Machinery" May and June 1951, of "Possibilities and limitations of the Marform process", by Henry P. Hessler, J. E. Broderick and Fred C. Young, supplemented by a more through description of the operation by Mahlon A. Winter. Part II of PB 105800.

METAL FINISHING. REPORT OF A VISIT TO THE U.S.A. IN 1950 OF A SPECIALIST TEAM REPRESENTING THE BRITISH METAL FINISHING INDUSTRY. Anglo-American Council on Productivity. Nov 1951. 93p photos, map, drawings, graphs, tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.90.
PB 106420

1. Metals - Finishing 2. Metals - Electroplating.

NON-FERROUS METALS (WROUGHT) REPORT OF A VISIT TO THE U.S.A. IN 1950 OF A PRODUCTIVITY TEAM REPRESENTING THE WROUGHT NON-FERROUS METALS INDUSTRY. Anglo-American Council on Productivity. Apr 1951. 109p photo, map, drawings, diagrs, tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $1.15. PB 106421

1. Metals, Non-ferrous 2. Metal industry.

OPEN-HEARTH STEEL FURNACE PRODUCTIVITY, by Roy W. Tindula. U. S. Office of Technical Services. Feb 1952. 15p Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. Mimeo: $.50. PB 106209

1. Open hearth furnaces.

SELECTED GOVERNMENT RESEARCH REPORTS. VOL. 3: PROTECTION AND ELECTRODEPOSITION OF METALS. Gt. Brit. Ministry of Supply. 1951. 376p photos, drawings (1 fold) graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $6.75.
PB 106247

1. Metals - Coatings, Protective - Gt. Brit. 2. Metals - Corrosion prevention - Gt. Brit. 3. Metals - Electroplating - Gt. Brit. 4. Gt. Brit. Dept. of Scientific and Industrial Research. Technical Information and Documents Unit.

S. O. Code no. 51-294-3. Contents: Report no. 1. R.A.E. hot half-hour chromate bath for the protection of magnesium alloys (based on R.A.E. report Jan 1947) by L. F. LeBrocq and H. G. Cole. - Report no. 2. Control of sulphuric acid anodic baths (based on R.A.E. report Sep 1939). - Report no. 3. Control and simplification of Bengough anodic process (based on R.A.E. report Jan 1939), by J. W. W. Willstrop. - Report no. 4. Treatment in cold chromate baths of magnesium alloy parts previously treated in the acid chromate dip and lanolined (based on R.A.E. Tech. note Jan 1946), by H. G. Cole and E. Parry. - Report no. 5. Cleaning and re-chromate treatment of magnesium alloy castings, with special reference to corroded parts machined to close limits (based on R.A.E. report Jan 1944), by L. F. LeBrocq and Fl. Lt. Rakowski. - Report no. 6. Note on the treatment of magnesium alloy to specification D.T.D. 118 in cold chromate baths (baths i and ii of specification D.T.D. 911) after preliminary treatment in the acid chromate dip (bath iv of specification D.T.D. 911) (based on R.A.E. Tech. note Jan 1944), by M. K. Petch. - Report no. 7. Chromate treatments for magnesium alloys with special reference to cold baths (based on R.A.E. report Mar 1942), by L. F. LeBrocq. - Report no. 8. Electrolytic polishing of aluminium alloys (based on R.A.E. report Nov 1943), by B. W. Mott and E.C.W. Perryman. - Report no. 9. Methods of removal of corrosive perspiration deposits from steel (based on A.R.D. Met. Report July 1945), by S. G. Clarke and E. E. Longhurst. - Report no. 10. A bright dip for steel (based on A.R.D. Met. report Jan 1944), by G. E. Gardam. - Report no. 11. Protection of steel by different lanolin solutions (based on A.R.D. Met. report Feb 1944), by S. G. Clarke and E. E. Longhurst. - Report no. 12. Water vapour permeability of organic coatings (based on C.C.I. report). - Report no. 13. Occurrence of intercrystalline attack in material to B. S. specification L. 40 during anodic treatment (based on R.A.E. report Jul 1945), by B. W. Mott and M. B. Waldron. - Report no. 14. Corrosion tests of wrought and cast aluminium alloys anodised in chromic acid solutions (based on R.A.E. report Oct 1944), by E. G. Savage. - Report no. 15. Corrosion tests of duralumin anodically treated in sulphuric acid baths containing aluminium salts (based on R.A.E. report Jan 1941). - Report no. 16. Corrosion tests of duralumin anodically treated in chromic-acid solutions (based on R.A.E. report Dec 1940), by H. C. Davis. - Report no. 17. Variations in corrosion properties on different parts of magnesium alloy sheet, by E. R. W. Jones and M. K. Petch, with an appendix on the determination of small amounts of iron in magnesium alloys, by A. Bacon and H. C. Davis (based on R.A.E. report Feb 1944). - Report no. 18. Influence of surface contamination on the corrosion of magnesium alloy sheet to specification D.T.D. 118 (based on R.A.E. report

Nov 1946), by F/Lt. L. Rakowski. - Report no. 19. Protection of magnesium alloys against corrosion by electrolytic chromate films (based on R.A.E. report Mar 1944), by M. K. Petch. - Report no. 20. Technical note on tropical corrosion tests on magnesium alloy sheet in contact with other metals (based on R.A.E. Tech. note Jan 1946), by L. F. LeBrocq and T. L. Williams. - Report no. 21. Chemical analysis of cyanide zinc plating solutions (based on R.A.E. report Aug 1947), by A. Bacon. - Report no. 22. Determination of phosphorus in the presence of chromium compounds (based on R.A.E. report Mar 1944), by A. Bacon and H. C. Davis. - Report no. 23. Test for traces of zinc in nickel plating baths (based on A.R.D. Met. report Oct 1945), by B. S. Evans. - Report no. 24. Estimation of nickel, cobalt, chloride, formate and formaldehyde in nickel-cobalt plating solutions (based on A.R.D. Met. report Jun 1946), by F. W. Salt. - Report no. 25. Revised methods of analysis of chromium plating solutions (based on A.R.D. Met. report Jul 1945), by F. W. Salt. - Report no. 26. Corrosion tests on aluminium alloy sheet clad with an aluminium coating of 99.36% purity (based on R.A.E. Tech. note Jul 1945), by C. Braithwaite. - Report no. 27. Selenium coatings for the protection of magnesium alloys against corrosion (based on R.A.E. report Apr 1943), by L. F. LeBrocq and H. G. Cole. - Report no. 28. New time-of-gassing test of thickness of cadmium coatings, particularly for small parts (based on A.R.D. Met. report Oct 1946), by S. G. Clarke and J. F. Andrew. - Report no. 29. A. R. D. magnetic thickness tester for coatings on steel (based on A. R. D. Met. report Jul 1944), by E. S. Spencer-Timms. - Report no. 30. Ammonium nitrate method for determination of thickness of cadmium coatings by loss-in-weight (based on A. R. D. Met. report Jul 1939), by S. G. Clarke and E. E. Longhurst. - Report no. 31. Inspection tests for the adhesion of electroplated coatings with particular reference to the B.N.F. adhesion test (based on A.R.D. Met. report Jan 1940), by A. W. Hothersall and C. J. Leadbeater. - Report no. 32. Study of some chemical reactions employed in photometric analysis (based on R.A.E. report Jan 1946), by H.C. Davis and A. Bacon. - Report no. 33. Further studies on the silico-molybdate reaction (based on R.A.E. report May 1947), by A. Bacon.

SILVER PLATING PROCESS FOR MAGNESIUM ALLOYS, by H. K. Delong. Dow Chemical Co. Magnesium Laboratories, Midland, Michigan. Dec 1947. 14f table Microfilm $1.75, Enlargement Print $3.75. PB 106071

1. Magnesium alloys - Coatings, Silver 2. Silver plating 3. Micro BIOS ORR 515/50, Frames 1-14. Contract W28-099-ac-295. Report 14704. Abstract available as PB 106071s. 1p. Microfilm $1.25, Photostat $1.25.

STUDY OF POISSON' RATIO IN THE YIELD REGION, by George Gerard and Sorrel Wildhorn. U. S. National Advisory Committee for Aeronautics. Jan 1952. 30p photos, diagrs, graphs Microfilm $2.00, Photostat $3.75. PB 106183

The variation in Poisson's ratio from the elastic to the plastic value was studied experimentally by a systematic series of tests on several aluminum alloys. The tests were conducted under simple tensile and compressive loading along three orthogonal axes. A theoretical variation of Poisson's ratio for an orthotropic solid was obtained from dilatational considerations. The assumptions used in deriving the theory were examined by use of the test data and were found to be in reasonable agreement with experimental evidence. Appendix: Gage-factor correction for one-dimensional stress field. NACA TN 2561.

SURVEY OF PORTIONS OF THE COBALT-CHROMIUM-IRON-NICKEL QUATERNARY SYSTEM, by E. L. Kamen and Paul A. Beck. U. S. National Advisory Committee for Aeronautics. Feb 1952. 62p photos, diagrs, graphs, tables Microfilm $3.00, Photostat $8.75. PB 106314

An isothermal survey was made of certain portions of the chromium-cobalt-nickel-iron quaternary system at 1200° C. The iron content was varied up to 30 percent to include the range of commercial chromium-cobalt-nickel alloys. The component cobalt-chromius-iron ternary system was also studied. NACA TN 2603.

VOLÄUFIGE WERKSTOFFPRÜFUNG: STAHL UND NICHTEISENMETALLE (PRELIMINARY TESTS OF MATERIALS: STEEL AND NON-FERROUS METALS) WERKSTOFFPRÜFUNG: CHEMISCHE UND MECHANISCHE PRÜFUNG (TESTS OF MATERIALS: CHEMICAL AND MECHANICAL TESTS). Germany. Oberkommando des Heeres. Jun 1931-Nov 1939. 5f (Text in German) Microfilm $1.25, Enlargement Print $1.50. PB 106563

1. Materials - Testing standards - Germany. Part of ONI, London. Reel 21-1B. PG-7824-NID.

METEORALOGY AND CLIMATOLOGY

EVALUATION OF CLIMATIC EXTREMES. U. S. Office of the Quartermaster General. Military Planning Division. Research and Development Branch. Mar 1951. 50p graphs, tables Microfilm $2.50, Photostat $6.25. PB 106360

1. Weather forecasting - Methods 2. Climatology - Research 3. QMC EPS 175.

HUMIDITY STUDIES, A LITERATURE SURVEY PREPARED by Francis D. Horigan. U. S. Office of the Quartermaster General. Military Planning Division. Research and Development Laboratories. Technical Library. Nov 1951. 37p Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. Mimeo: $1.00. PB 106382

This selective list of references covers the years 1945-1951. It is not intended as a complete survey but rather as an introduction to the vast field of literature on the subject of humidity. An attempt has been made to include the most pertinent articles so that a technologist could obtain a comprehensive, though brief, survey of the field. The arrangement is by subject. Each subject is further divided alphabetically by author. An author and patentee index is appended. QMC TL BS no. 19.

PROJECT CIRRUS. QUARTERLY PROGRESS REPORT NO. 16, JUL 1-OCT 1, 1951, PREPARED by Vincent J. Schaefer and Bernard Vonnegut. General Electric Co. Research Laboratory, Schenectady, N. Y. Oct 1951. 10p Microfilm $1.25, Photostat $1.25. PB 106595

1. Rain, Simulated 2. Clouds - Formation 3. Ice formation - Meteorological analysis 4. GE RL 611.

Dept. of the Army project: 3-99-07-022. Signal Corps project: 24-172 B-O. First quarterly report issued under Contract no. DA-36-039-sc-15345.

PROJECT CIRRUS. QUARTERLY PROGRESS REPORT NO. 17, OCT 1, 1951-JAN 1, 1952, PREPARED by Vincent J. Schaefer. General Electric Co. Research Laboratory, Schenectady, N. Y. Jan 1952. 8p Microfilm $1.25, Photostat $1.25. PB 106596

1. Clouds - Formation 2. Rain, Simulated 3. Ice formation - Meteorological analysis 4. GE RL 643.

Dept. of the Army project: 3-99-07-022. Signal Corps project: 24-172 B-O. Second quarterly progress report under Contract no. DA-36-039-sc-15345.

MINERALS AND MINERAL PRODUCTS

COMMERCIAL DEVELOPMENT OF DENSE CORDIERITE BODIES. PROGRESS REPORT NO. 1, JUNE 15-OCT 15, 1949, UNDER CONTRACT NO. W36-039-SC-44484, by F. P. Hall and Robert Morgan. Pass & Seymour, Inc., Syracuse, N. Y. Oct 1949. 29p tables Microfilm $2.00, Photostat $3.75. PB 106543

Raw materials and equipment have been secured for the commercial production of dense cordierite bodies that were developed at the New Jersey Ceramic Research Station under Signal Corps. Contract No. W36-039-sc-32028. Properties of body G10A has been investigated as affected by: (1) Method of preparation; (2) Grain size of granules used in pressing; (3) Total pressure required to adequately press the body; (4) Temperature and time of soak required to completely vitrify this body. Samples have been prepared for the loss-factor tests and the dielectric-strength-tests JAN-1-10. Dies have been built for the production of feed through insulators compression moulded made in accordance with the dimensions specified in Joint Army-Navy specifications No. JAN-1-8, under Type NS-4001. For reports 2-4 see PB 106544-106545, 104387.

COMMERCIAL DEVELOPMENT OF DENSE CORDIERITE BODIES. PROGRESS REPORT NO. 2, OCT 15, 1949 TO JAN 15, 1950, UNDER CONTRACT NO. W36-039-SC-44484, by F. P. Hall and Robert Morgan. Pass & Seymour, Inc., Syracuse, N. Y. Jan 1950. 23p graphs, tables Microfilm $2.00, Photostat $3.75. PB 106544

Samples of Body G10-A as developed at the New Jersey Ceramic Research Station under Signal Corps Contract No. W36-039-SC-32028 and produced at Pass & Seymour, Inc., have been submitted to the Squier Signal Laboratory for tests on (1) loss factor and dielectric constant (2) dielectric strength, (3) flexural strength, and (4) resistance to thermal change. Results obtained indicated that the body had an average dielectric strength of 195 volts per mil. Loss factor and dielectric constant tests indicated a Grade L-3 ceramic (Jan. 1-10). Feed through insulators, compression moulded, and made in accordance with dimensions specified in Jan-1-8 under TYPE NS-4001, have been shipped to the Squier Signal Laboratory. Tubes made in accordance with dimensions specified in JAN-1-8 TYPE NS-6004 have been extruded and fired. Certain die changes will be required to meet the above specifications. For reports 1, 3-4 see PB 106543, 106545, 104387.

COMMERCIAL DEVELOPMENT OF DENSE CORDIERITE BODIES. PROGRESS REPORT NO. 3, JAN 15-APR 15, 1950, UNDER CONTRACT NO. W36-039-SC-44484, by F. P. Hall and Robert Morgan. Pass & Seymour, Inc., Syracuse, N. Y. Apr 1950. 14p tables Microfilm $1.75, Photostat $2.50. PB 106545

The possibility of the use of a modified dry-mix method for the preparation of dry-press body material suitable for the production of dense cordierite bodies has been investigated. The dry-mix method has been found satisfactory provided sufficient water is added to bring the mix to a stiff-mud consistency previous to granulation. Feed-through insulators Type NS-4001 and Tubes Type NS-6004 have been produced and shipped to the Squier Signal Corps Laboratory. The original contract has been completed. A modification of the contract has been issued by the Squier Signal Laboratory, permitting Pass & Seymour to conduct experiments directed towards the improvement of the electrical properties of the original G10a body as developed at Rutgers University. Experiments along this line are described. For reports 1-2, 4 see PB 106543-106544, 104387.

EXPANDED SHALE AGGREGATE IN STRUCTURAL CONCRETE, by D. D. Ritchie and S. H. Graf. Oregon. Engineering Experiment Station, Corvalis, Ore. Aug 1951. 70p photos, graphs, tables Available from Engineering Experiment Station, Oregon State College, Corvallis, Oregon. PB 106298

1. Concrete aggregates 2. Concrete construction 3. Shale - Structural uses 4. Lite - Rock (Trade name) 5. O EES B30.

PACKING AND PACKAGING

COLLAPSIBLE TUBES FOR M5 PROTECTIVE OINTMENT PACKAGING, by Theodore P. Steinmetz and Milton A. Raun. U. S. Chemical Corps. Chemical and Radiological Laboratories, Army Chemical Center, Maryland. Feb 1952. 12p table Microfilm $1.75, Photostat $2.50. PB 106338

1. M5 (Ointment) 2. Tubes, Collapsible 3. Ointments, Protective - Packaging 4. CC CRL IR 88.

Project 4-91-06-001, Interim report.

RESULTS OF TESTS ON DESERT STORAGE OF IMPREGNITE XXCC 3 in EXPERIMENTAL FIBER DRUMS, by Milton A. Raun. U. S. Chemical Corps. Chemical and Radiological Laboratories, Army Chemical Center, Maryland. Feb 1952. 9p Microfilm $1.25, Photostat $1.25. PB 106339

TECHNICAL REPORTS News letter

PUBLISHED MONTHLY

U. S. DEPARTMENT OF COMMERCE
OFFICE OF TECHNICAL SERVICES
WASHINGTON 25, D. C.

NO. 35, MAY 1952

"Boosters" for DEFENSE PRODUCTION

Technical information that can help defense industries to achieve better products, increased production, or reduced costs is provided by the following publications now available at nominal cost.

DEVELOPMENTS IN SHELL-MOLD CASTING PROCESS. An over-all picture of the latest technical and patent developments in the "shell-mold" or "C" process for producing metal castings is presented in a report by the Office of Technical Services of the Department of Commerce.

Instead of making the molds for the castings from sand bonded with clay, this new process uses molds of sand bonded with plastics. The resulting molds are thinner, stronger and smoother; hence produce a more accurate casting, with better surface, at lower cost.

Where this process should be used; the latest techniques in using it; patent developments in Germany, where the process originated; and patent developments in the U.S., where the process has been further developed, are all discussed in this report. An excellent bibliography is included. Order PB 106 640 Mimeo $.25.

METAL FINISHING. Many a plant producing metal products can gain helpful ideas for greater productivity in metal finishing from a British productivity team which surveyed this field of American industry. The illustrated book-length report has one especially good chapter on "Painting" and another on "Electroplating and Allied Finishing". Order PB 106 420 Mimeo $.90. (Continued on Next Page)

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WELDING SURVEY. Practices throughout U. S. industry that make for high productivity in welding are reviewed in a well-illustrated book-length report by a visiting British productivity team. Mechanical Handling, Preparation and Heat Treatment, Welding Processes and Equipment, and Inspection and Testing receive full chapter treatment. Order PB 106431 Mimeo $.90.

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IMPREGNATION OF METAL CASTINGS. The best impregnants to use and desirable procedures for applying them to make porous castings air- and water-tight are briefly reviewed in a report by Canadian Research Council. A bibliography is included. Request 10A.

WORKING NON-FERROUS METALS. A British Productivity Team studied the manufacture of non-ferrous (copper and zinc) products in the U. S. In an illustrated book-length report they matched up British and American practices in melting and casting, rolling, extruding, wire drawing and tube drawing. The comparisons are made in a way that brings into prominent relief the principal factors that contribute to high productivity. Order PB 106421 Mimeo $1.15.

VALVES. Valuable alike to large chemical plant operators who must maintain large numbers of valves and to operators of metal-working plants which manufacture them, is the book-length report of a British productivity team which surveyed steel, iron and non-ferrous valve manufacture in the U. S. Report stresses the productivity-increasing factors in management, production methods, plant facilities and equipment, and design. Order PB 106430 Mimeo $.90.

FOR AUDIO EQUIPMENT BUILDERS. Designers of acoustical equipment will be helped by an analysis of sound wave propagation based on charting sound "fields". This method is presented in a fundamental German text translated by the Naval Research Laboratory. The 134-page text has 100 figures and a bibliography. Order PB 106157 Mimeo $3.50.

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TOWARD BETTER AIRCRAFT STRUCTURES. Engineers can build better aircraft structures by applying loads to rubber models of the metal skins of aircraft, and then measuring the resulting stretch of the rubber. A British research report details the technique and indicates that, by using it, stresses can be conveniently determined (with sufficient accuracy for engineering purposes) in those structural components which are too complex for stress analysis by current analytical methods. "The Use of Rubber Models in Stress Investigations" is available from the British Information Service, 30 Rockefeller Plaza, New York 20, N. Y. at $1.00 a copy.

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DEHYDRATING MEATS. Search for a good emergency ration in Arctic area led the Quartermaster Corps to a basic investigation of dehydrated meats. A research report just released from security restrictions gives results of this study and concludes that meat should be dehydrated from the pre-cooked rather than the raw state, because dehydration from the cooked state can be accomplished in a much shorter time. An extensive investigation of the effect of various dehydration procedures on the dehydration properties of the meat is described. Order PB 105 953 Microfilm $2.75, Photostat $7.50.

FOR THE DAIRY INDUSTRY. Quality control, the statistical technique for keeping production at the desired quality level with a minimum of cost, can be profitably applied to the dairy industry as well as to manufacturing. A report which tells how shows application of the technique to the fluid milk plant, cheddar cheese plant, butter plant, and evaporated milk plant. Order "An Investigation of the Application of Statistical Quality Control to Dairy Manufacturing" from Texas Engineering Experiment Station, College Station, Texas. Limited number of copies available without charge.

SALTED PEANUT MANUFACTURE. The supplies, equipment, and procedures required to operate a plant for mass production of dry-roasted or oil fried peanuts are indicated in an OTS report. Order PB 106 520 Mimeo $.25.

LIGHTWEIGHT CONCRETE. A brief survey of the whole field of light-weight concrete--the types of aggregate used, its properties, etc. is given in a British Building Research Pamphlet. Order Building Research Station Digest #32 from the British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. Price $.10.

For Dependable ELECTRONIC EQUIPMENT TESTING

The basic testing tool in the electronic equipment manufacturing industries is the standard signal generator, an instrument which produces electrical signal outputs of the kind and amount needed for the particular test purpose. Valuable, therefore, to all electronic equipment manufacturers is a Naval Research Laboratory report which describes a survey made on some of the common types of signal generators.

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Order "Survey of Productivity Factors in Four Southern States" from Texas Engineering Experiment Station, the Texas A. & M. College System, College Station, Texas. A limited number of copies available without charge.

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Project 4-91-06-001, Interim report.

RESULTS OF TESTS PERFORMED ON EXPERIMENTAL FIBER DRUMS FOR STORAGE OF IMPREGNITE XXCC3, by Milton A. Raun. U. S. Chemical Corps. Chemical and Radiological Laboratories, Army Chemical Center, Maryland. Feb 1952. 36p photos, fold drawings Microfilm $2.25, Photostat $5.00. PB 106383

1. Containers, Fiber 2. Impregnants - Storage 3. XXCC3 (Impregnite) 4. CC CRL IR 91.
Project 4-91-06-001, Interim report.

RIGID BOXES AND CARTONS. REPORT OF A VISIT TO THE U.S.A. IN 1950 OF A PRODUCTIVITY TEAM REPRESENTING THE RIGID BOXES AND CARTONS INDUSTRY. Anglo-American Council on Productivity. Feb 1951. 56p photos, map, drawings, graphs, table Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.50. PB 106424

1. Boxes - Manufacture 2. Containers - Manufacture.

ÜBER DIE WIRKUNG VON WEISS-UND BRAUNSCHLIFFEN AUF UNBELICHTETE RÖNTGENFILME (EFFECT OF CONVENTIONAL AND STEAMED GROUNDWOOD PULP ON UNEXPOSED X-RAY FILMS), by Suettinger. Darmstadt. Technische Hochschule. Institut für Papierfabrikation. Jan 1944. 6f (Text in German) Microfilm $1.25, Enlargement Print $2.50. PB 106069

1. Containers, Shipping - Plywood - Germany 2. Wood pulp - Effect on X-ray film - Germany 3. Films (Photography), X-ray - Packaging - Germany 4. FIAT FR 487 LD appx. E 5. Micro BIOS DOCS 1720 (81) 6. Micro BIOS FD 437/47, Frames 52258-52263.
English abstract is PB 106069s. Listed in FIAT FR 487, appendix E, Bericht 259/44.

PAPER AND ALLIED PRODUCTS

CHARACTERISTICS OF PULP FIBERS FROM AGRICULTURAL RESIDUES, by Elbert C. Lathrop. U. S. Northern Regional Research Laboratory, Peoria, Ill. Jan 1952. 14p graphs, tables Available free from U. S. Bureau of Agricultural and Industrial Chemistry, Dept. of Agriculture, Washington 25, D. C. PB 106588

1. Paper pulp - Recovery from agricultural residues 2. Wood pulp - Recovery from agricultural residues 3. Cellulose - Pulps 4. Cellulose, Wood - Uses 5. AIC 323.

DETERMINATION OF TUNGSTEN IN WOOD AND WOOD PULP, by Gunnar Gran. Svenska Träforskningsinstitutet. Träkemi och Pappersteknik. 1951. 5p graphs, table Microfilm $1.25, Photostat $1.25. PB 106395

1. Tungsten - Determination - Sweden 2. Wood - Tungsten content - Sweden 3. Wood pulp - Tungsten content - Sweden 4. Svenska Träforskningsinstitutet. Träkemi och Pappersteknik. Meddelande 84.
Reprinted from Svensk Papperstidning 54 (1951) p. 764-768.

ERFAHRENHETER UNDER AR 1950 FRAN ANVÄNDNINGEN AV ORGANISKA KVICKSILVERFÖRENINGAR MOT SVAMPSKADOR I SHIPMASSA (EXPERIENCES GAINED DURING 1950 IN THE APPLICATION OF ORGANIC MERCURY COMPOUNDS AGAINST FUNGAL DAMAGES TO WET GROUND WOOD PULP) by Stig O. Pehrson. Svenska Träforskningsinstitutet. Träkemi och Pappersteknik. 1951. 7p photos, tables (Text in Swedish) Microfilm $1.25, Photostat $1.25. PB 106512

Phenyl mercurials have now been extensively employed in Sweden during several years as preservatives against fungal damages of wet groundwood pulp. Several effective preparations, especially adapted for the application in the groundwood pulp industry, are available on the Swedish market. These disinfectants may be added, undiluted or diluted with water, to the most suitable point in the system, as the phenyl mercury ions shows a great affinity to the fibre. A ten percent solution of phenyl mercury acetate, which is the preparation most commonly employed, is usually added at a rate of 250 g per wet ton of pulp (50 percent moisture content). The cost for this treatment will not exceed Sw. cr. 1:25 per wet ton. The treatment does not yield a sterile product, but results in a satisfactory protection from a commercial point of view. After prolonged storage the mercury content of the treated pulp seems to decrease and consequently the chances for fungal attack increase. Wet pulp treated with phenyl mercurials has been stored for 17 months, of which 15 months in England, without any attack of either blueing or rotting fungi. In one case, however, fungal attack could not be prevented for more than six-eight months, probably due to a rapid drop in the mercury content of the bales. In a third case, treated pulp was still in perfect condition after eight months' storage. Abstract in English. Reprinted from Svensk Papperstidning 54 (1951) p. 401-407. Svenska Träforskningsinstitutet. Träkemi och Pappersteknik. Meddelande 71.

FIBERSTRUKTUR OCH MASSAEGENSKAPER. I: EN ARBETSHYPOTES (FIBER STRUCTURE AND PULP PROPERTIES. I: BY HYDROLYSIS METHOD) by William H. Algar, Hans Wilhelm Giertz and Anne Marie Gustafsson. Svenska Träforskningsinstitutet. Träkemi och Pappersteknik. 1951. 10p photos, graphs, tables (Text in Swedish) Microfilm $1.25, Photostat $1.25. PB 106515

1. Cellulose - Determination - Sweden 2. Cellulose - Hydrolysis - Sweden 3. Hydrolysis - Methods - Sweden 4. Nickerson hydrolysis method. 5. Svenska Träforskningsinstitutet. Träkemi och Pappersteknik. Meddelande 76.
Reprinted from Svensk Papperstidning 54 (1951) p. 335-344. Abstracts in English and German. Table headings in English.

FOLDING ENDURANCE TEST. PART I: STATISTICAL ASPECTS, by Olle Andersson. Svenska Träfor-

skningsinstitutet. Träkemi och Pappersteknik. 1951. 6p graphs Microfilm $1.25, Photostat $1.25.
PB 106399

1. Paper - Fatigue tests - Sweden 2. Svenska Träforskningsinstitutet. Träkemi och Pappersteknik. Meddelande 88.

Pt. 2 is PB 106397. Reprinted from Svensk Papperstidning 54 (1951) p. 591-596.

FOLDING ENDURANCE TEST. PART II: METHOD OF MEASUREMENT, by Thomas Wahlberg. Svenska Träforskningsinstitutet. Träkemi och Pappersteknik. 1951. 7p photo, diagr, graphs, tables Microfilm $1.25, Photostat $1.25. PB 106397

1. Paper - Fatigue tests - Methods - Sweden 2. Paper handling machines - Sweden 3. Köhler - Molin folding tester 4. Svenska Träforskningsinstitutet. Träkemi och Pappersteknik. Meddelande 86.

Pt. I is PB 106399. Reprinted from Svensk Papperstidning 54, no. 20,1951.

ISOLATION AND PROPERTIES OF ALUMINIUM DI- AND MONO-ABIETATE: STUDIESON ROSIN SIZING, by Ernst Back and Börje Steenberg. Svenska Träforskningsinstitutet. Träkemi och Pappersteknik. 1951. 6p graphs, tables Microfilm $1.25, Photostat $1.25. PB 106392

This paper deals with the existence and isolation of aluminium abietates. It is shown that aluminium abietates are formed during a process corresponding to rosin sizing, and a method is obtained to extract aluminium resinates from sized commercial papers. Reprinted from Svensk Papperstidning 54 (1951) p. 510-516. Svenska Träforskningsinstitutet. Träkemi och Pappersteknik. Meddelande 81.

KLORIDIOXIDBLEKNING. I: ANALYSMETODER (BLEACHING OF PULP WITH CHLORINE DIOXIDE AND CHLORITE. I: ANALYTICAL METHODS) by Hans Wilhelm Giertz. Svenska Träforskningsinstitutet. Träkemi och Pappersteknik. 1951. 8p graphs, tables (Text in Swedish) Microfilm $1.25, Photostat $1.25. PB 106516

1. Wood pulp - Bleaching - Sweden 2. Colorimetry - Sweden 3. Chlorates - Analysis - Sweden 4. Chlorine compounds - Analysis - Sweden 5. Chlorine dioxide - Analysis - Sweden 6. Chlorine dioxide chlorate mixtures - Analysis - Sweden 7. Svenska Träforskningsinstitutet. Träkemi och Pappersteknik. Meddelande 77.

Abstracts in English and German. Reprinted from Svensk Papperstidning 54 (1951) p. 469-476.

MASSAKVALITE OCH PAPPERSKVALITE (STRENGTH TESTS ON MACHINE-MADE PAPER AND LABORATORY HAND SHEETS), by Olle Andersson. Svenska Träforskningsinstitutet. Träkemi och Pappersteknik. 1951. 5p diagr, tables (Text in Swedish) Microfilm $1.25, Photostat $1.25. PB 106398

Routine tests on strength data on sack paper of constant basis weight and the corresponding pulp from 300 days of production have been investigated statistically. Relationships, indicated by correlation coefficients, have been derived between different paper strength data on machine made paper as well as laboratory hand sheets and both. The relation between strength properties of machine made paper and laboratory hand sheets is rather weak. The relation between properties of laboratory hand sheets beated in the laboratory beater and the mill jordan is considerably stronger. This indicates that there is a considerable difference between the properties of the sheets made in the papermachine and the laboratory sheet machine. Relationships between different strength properties of the same material are derived. There are relatively weak relations between bursting strength and other properties, whilst the opposite is valid for tear. In the case investigated there is a positive correlation between tensile strength and tear of machine made paper but a negative correlation between the same properties of the corresponding pulp. A possible explanation is given in connection with a discussion of the nature of the tear test. The bursting strength test is discussed in more detail and formulae for the stress distribution in the paper in the burst tester are derived. Reprinted from Svensk Papperstidning 54 (1951) p. 505-509. Presented at the meeting of the Swedish Association of Paper and Cellulose Engineers, Mar. 2, 1951. Svenska Träforskningsinstitutet. Träkemi och Pappersteknik. Meddelande 87.

MODIFIED CUPRIETHYLENE DIAMINE METHOD FOR CELLULOSE VISCOSITY DETERMINATIONS, by Karl Erik Almin. Svenska Träforskningsinstitutet. Träkemi och Pappersteknik. 1951. 4p graph, tables Microfilm $1.25, Photostat $1.25. PB 106400

1. Cellulose - Viscosity - Sweden 2. Viscosity - Measurements - Sweden 3. Svenska Träforskningsinstitutet. Träkemi och Pappersteknik. Meddelande 89.

Reprinted from Svensk Papperstidning 54 (1951) p. 628-631.

NEW METHOD FOR THE DETERMINATION OF ROSIN SIZE IN PAPER, by Ernst Back. Svenska Träforskningsinstitutet. Träkemi och Pappersteknik. 1951. 5p graphs, tables Microfilm $1.25, Photostat $1.25. PB 106393

This paper presents a new and simplified method for the determination of rosin size in paper, giving more reliable results than present methods. The new method is based on the solubility of aluminium resinates in chloroform, according to Back and Steenberg. A relation has been shown to exist between the degree of saponification of the rosin size and the amount of rosin bound aluminium in the size co-precipitate. Consequently the degree of saponification of the rosin size in an unknown paper sample can be estimated. Results are given showing significent differences in this respect between commercial papers produced with a high-free (Bewoid) size and fully saponified (Delthirna) size. The solubility properties of resin acids and aluminium resinates are changed by oxidation, resulting in serious limitations of all present methods for the determination of rosin size in paper. These limitations were studied on paper samples treated by heat and light. The desizing effect was followed by contact angle measurements. Reprinted from Svensk Papperstidning 54 (1951) p. 516-520. Svenska Träforskningsinstitutet. Träkemi och Pappersteknik. Meddelande 82.

OPACITETEN HOS PAPPERSMASSOR. PT. II: ALLMÄNNA SYNPUNKTER (OPACITY OF PAPER) by Hans Wilhelm Giertz. Svenska Träforskningsinstitutet. Träkemi och Pappersteknik. 1951. 8p diagrs, tables (Text in Swedish) Microfilm $1.25, Photostat $1.25. PB 106511

A survey is given of the general factors determining the opacity of paper. Lightscattering is not only caused by repeated macro-optical reflexion and refraction but also by optical effects caused on a submicroscopic scale by very small particles or inhomogenities in the structure. Calculations show that the refractive index of the fiber material of technical pulps probably varies only within so narrow limits that the light scattering is not affected. Thus, according to equation I, the opacity will primarily be determined by the amount of optically refracting surfaces not only occur on the outer and lumen surfaces of the fibers, but that account must also be taken, in this respect, of the capillaries and empty spaces inside the fiber wall. The opacity thus depends on the size of the fibers and their internal structure. It is further claimed that there is a close relationship between the density and strength of a paper, and its opacity. A discussion is given of the manner in which opacity can be influenced by differen operations occurring during pulp and paper manufacture, viz. cooking, bleaching, drying and beating. Abstracts in English and German. Reprinted from Svensk Papperstidning 54 (1951) p. 267-274. Svenska Träforskningsinstitutet. Träkemi och Pappersteknik. Meddelande 70.

SOLUBILISERINGSFENOMEN VID HARTSUTLÖSNING I PAPPERSTEKNISKA OCH CELLULOSATEKNISKA PROCESSER (SOLUBILIZATION PHENOMENA AT THE DISSOLUTION OF RESINOUS MATERIAL IN PULP AND PAPER MAKING) by Ernst Back. Svenska Träforskningsinstitutet. Träkemi och Pappersteknik. 1951. 5p diagrs, tables (Text in Swedish) Microfilm $1.25, Photostat $1.25. PB 106394

A survey is given of colloid chemical phenomena at the alkaline dissolution of resinous materials, namely the solubilization of unsaponifiable, water, insoluble resinous components by the fatty and resin acid soaps formed on saponification. In this dissolution process the soaps show properties typical for surface active agents in water solution, i.e. micelle formation and solubilization of water insoluble or slightly soluble organic substances. After a review on the general structure and solubilization properties of soaps, data available on the micelle formation and solubilization power of resinous components in wood are tabulated. This information is used to discuss the dissolution of resinous matter in pulp making. A few factors important for the dissolution process are demonstrated by experiments employing a ray cell pulp containing 16% resinous matter. Reprinted from Svenska Papperstidning 54 (1951) p. 657-662. Abstracts in English and German. Svenska Träforskningsinstitutet. Träkemi och Pappersteknik. Meddelande 83.

SOME FACTORS AFFECTING THE STRESS-STRAIN CHARACTERISTICS OF PAPER, by Olle Andersson and Edward Berkyto. Svenska Träforskningsinstitutet. Träkemi och Pappersteknik. 1951. 8p graphs, tables Microfilm $1.25, Photostat $1.25. PB 106396

The influence of temperature on the stress-strain characteristics of paper have been studied for a temperature range of -50° to + 150°C. The slope of the stress-strain curves and the tensile strength both have been found to decrease with temperature. Lacking a sound, purely theoretical basis for the interpretation of the results, a purely emperical interpretation was made. Various equations were fitted to the data by the least mean square method and the goodness of fit was measured by calculating a correlation coefficient. Similarly linear equations were fitted to the breaking stress and breaking elongation-temperature data. Reprinted from Svensk Papperstidning 54 (1951) p. 437-444. Svenska Träforskningsinstitutet. Träkemi och Pappersteknik. Meddelande 85.

SULFITE PULPING PROPERTIES OF SPRUCE WOOD FROM UNPEELED, FLOATED LOGS. PART I: CATECHOL TANNINS IN THE SURFACE LAYER OF THE SAPWOOD, by Erich Adler. Svenska Träforskningsinstitutet. Träkemi och Pappersteknik. 1951. 6p graph Microfilm $1.25, Photostat $1.25. PB 106517

1. Spruce - Pulping - Sweden 2. Spruce - Analysis - Sweden 3. Tannins, Catechol - Sweden 4. Svenska Träforskningsinstitutet. Träkemi och Pappersteknik. Meddelande 79.

Reprinted from Svensk Papperstidning 54 (1951) p. 445-450. Presented at the meeting of the Swedish Association of Paper and Cellulose Engineers, Stockholm, Feb 28, 1951.

SULFITE PULPING PROPERTIES OF SPRUCE WOOD FROM UNPEELED, FLOATED LOGS. PART II: SULFITE COOKING EXPERIMENTS, by Erich Adler and Lennart Stockman. Svenska Träforskningsinstitutet. Träkemi och Pappersteknik. 1951. 6p tables Microfilm $1.25, Photostat $1.25. PB 106391

1. Sulfite pulp - Production - Sweden 2. Spruce - Conversion products - Sweden 3. Svenska Träforskningsinstitutet. Träkemi och Papperstiknik. Meddelande 80.

Reprinted from Svensk Papperstidning 54 (1950) p. 477-482. Presented at the meeting of the Swedish Association of Paper and Cellulose Engineers, Stockholm, Feb 28, 1951. Part I issued in Svensk: Papperstidning 54 (1951) p. 445.

PHOTOGRAPHIC AND OPTICAL GOODS

COMMENTARY VARIATIONS: LEVEL OF VERBALIZATION, PERSONAL REFERENCE, AND PHASE RELATIONS IN INSTRUCTIONAL FILMS ON PERCEPTUAL-MOTOR TASKS (RAPID MASS LEARNING) by John V. Zuckerman. Pennsylvania State College, State College, Pa. Dec 1949. 67p photos, diagrs, tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $1.00. PB 105785

1. Motion pictures, Educational 2. Motion pictures, Sound 3. Psychology, Applied 4. SDC TR 269-7-4.

Contract N6onr-269, T.O. VII, Project NR781-005. SDC Human Engineering Project 20-E-4.

LEARNING THEORIES AND INSTRUCTIONAL FILM RESEARCH (RAPID MASS LEARNING) by Kinsley R. Smith and E. B. van Ormer. Pennsylvania State College, State College, Pa. Jun 1949. 12p Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.25. PB 105787

1. Motion pictures, Educational 2. Motion pictures, Sound 3. Psychology, Applied 4. SDC TR 269-7-8. Contract N6onr-269, T. O. VII, Project NR 781-005. SDC Human Engineering Project 20-E-4.

A 100-WATT AMPLIFIER USING RECEIVING-TYPE TUBES ONLY, by E.L.R. Webb. National Research Council of Canada. Radio and Electrical Engineering Division. Jan 1952. 13p diagrs, graphs, tables Available from National Research Council of Canada, Ottawa, Canada. $.15. PB 106294

A 100-watt amplifier, originally designed to supply standard 60-cps power to a small synchronous motor, is briefly described. Because it employs only receiving-type tubes and has inherently good voltage regulation, the unit may be of general interest; for example, it may be used for the distribution of standard frequency signals in a large laboratory where the load is random. NRCC ERA-200. NRCC 2425.

VERPACKUNGSKARTEN FÜR RÖNTGENFILME (CARDBOARD CARTONS FOR PACKING X-RAY FILMS). Darmstadt. Technische Hochschule. Institut für Papierfabrikation. Dec 1942-Apr 1943. 18f (Text in German) Microfilm $1.75, Enlargement Print $3.75. PB 106070

1. Containers, Shipping - Plywood - Germany 2. Films (Photography), X-ray - Packaging - Germany 3. FIAT FR 487 LD appx. E 4. Micro BIOS DOCS 1720 (64) 5. Micro BIOS DOCS 1720 (70) 6. Micro BIOS BD 441/47, Frames 1-18.

English abstract available as PB 106070s. 2p. Microfilm $1.25, Photostat $1.25. Bericht 188/42 and 212/43. Listed in FIAT FR 487, appendix E.

PHYSICS

General

BIBLIOGRAPHY ON THE MEASUREMENT OF GAS TEMPERATURE, by Paul D. Freeze. U. S. National Bureau of Standards. Aug 1951. 16p Available from Superintendent of Documents, Government Printing Office, Washington 25, D. C. $.15. PB 106374

The various temperatures which are of interest in hot gases moving at high velocities, such as those constituting the working media of gas turbines and jet engines, are reviewed in an introduction to a bibliography of approximately 400 references on the measurement of gas temperatures in general. These references, grouped for convenience in accordance with instrument types, cover approximately the last 20 years. NBS C 513.

DEFLECTION OF CIRCULAR ARCS SUBJECT TO COMBINED FLEXURE AND TORSION, by Mervin B. Hogan. Utah. Engineering Experiment Station. Dept. of Mechanical Engineering. Apr 1947. 17p photos, diagrs, graphs, tables Available from The Director, Utah Engineering Experiment Station, University of Utah, Salt Lake City, Utah. PB 106044

This bulletin reports the measurement of the vertical deflection of horizontal circular arcs loaded by forces normal to the arcs' plane of curvature. Theoretical functions are derived and employed to calculate the deflections corresponding with those measured. This is done for steel arcs of three different cross sectional forms; the arcs being 180^{o}, 120^{o}, and 90^{o} in magnitude for each cross sectional shape. Satisfactory agreement is found to exist between the theoretical and measured results. Bulletin of the University of Utah, vol. 35, no. 19. UU EES B 27.

DEFLECTIONS OF THE VERTICAL FROM GRAVITY ANOMALIES, by Donald A. Rice. U. S. Army Map Service. Nov 1949. 23p graphs, maps, tables Microfilm $2.00, Photostat $3.75. PB 106574

Progress made in the study of deflections of the vertical from gravity anomalies is discussed. The basic principles involved in the determination of the deflections are outlined and the results of several tests are presented. For areas of reasonably level topography, such as found in the south-central region of the United States, astronomic positions to which the gravimetric deflections have been applied agree within one second with geodetic positions of the triangulation network. From the standpoint of simplicity and accuracy of results, in regions of relatively smooth topography free-air anomalies are highly satisfactory for computation of gravimetric deflections of the vertical. Project 8-35-04-002. AMS TR 2.

HANDBOOK FOR THE CALCULATION OF SOUND PROPAGATION PHENOMENA, by Heinrich Stenzel. 1939. 139p drawings, diagrs, graphs, tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. Mimeo: $3.50. PB 106157

1. Sound - Propagation - Germany 2. NRL T 130. Translated November, 1947, by A. R. Stickley from "Leitfaden zur berechnung von schallvorgängen", published by Julius Springer, Berlin (1939).

ON THE WAVE MAKING RESISTANCE AND LIFT OF BODIES SUBMERGED IN WATER. TRANSLATED BY ROSE JERMAIN, EDITED by Margaret W. Raven, by N. E. Kochin. Oct 1951. 121p diagrs Microfilm $5.00, Photostat $16.25. PB 106234

1. Waves in water - Resistance - Russia 2. Bodies, Submerged - Resistance - Russia 3. Bodies, Submerged - Lift - Russia 4. Flow, Three dimensional - Theory - Russia 5. NAVSHIPS T 438 6. STS 116. From Proceedings of the Conference on the Theory of wave resistance, p. 65-134.

SOLUTION OF THE NAVIER-STOKES EQUATION FOR SOURCE AND SINK FLOWS OF A VISCOUS HEAT-CONDUCTING COMPRESSIBLE FLUID, by Robert V. Hess. U. S. National Advisory Committee for Aeronautics. Feb 1952. 66p graphs (part fold)

table Microfilm $3.00, Photostat $8.75. PB 106348

A solution of the Navier-Stokes equation for source and sink flows of a viscous, heat-conducting, compressible fluid is given for the case of constant total flow energy. For the satisfaction of the condition of constant total flow energy, a certain Prandtl number is required. Aside from this more obvious requirement, the selection of a certain ratio of the first and second viscosity coefficient is necessary. The nature of the general solutions for flow with arbitrary Prandtl number and with heat addition is discussed. Furthermore, the manner is discussed in which the familiar heat-conduction effects combined with the peculiar viscous effects solely due to compressibility, sometimes called the longitudinal viscous effects, influence the flow through a curved minimum section joined to a sink flow. A discussion of the second viscosity coefficient from the gas-dynamic approach is also given. NACA TN 2630.

TRANSLATION OF BODIES UNDER THE FREE SURFACE OF A HEAVY FLUID OF FINITE DEPTH. by M. D. Haskind. TRANSLATED by Irville C. Lecompte, edited by Margaret W. Raven. Oct 1951. 26p diagr Microfilm $2.00, Photostat $3.75. PB 106236

1. Bodies, Submerged - Hydrodynamics - Russia 2. Bodies, Submerged - Lift - Russia 3. Bodies, Submerged - Resistance - Russia 4. NAVSHIPS T440 5. STS 114.

From Applied mathematics and mechanics, vol. 9, p. 67-78, 1945.

Nuclear

IMPLICATION OF THE TRANSPORT EQUATION FOR THE SEMIEMPIRICAL TREATMENT OF SHIELDS, by Philip Schwed. U. S. National Advisory Committee for Aeronautics. Mar 1952. 31p diagrs Microfilm $2.25, Photostat $5.00. PB 106407

The semiempirical method of dealing with shields by treating them as composed of layers is revised and extended by taking the angular distribution of the radiation into account and by making use of the transport equation to obtain expansions suitable for special cases. Such expansions are given for the case where multiple scattering with angular deviation is of relatively little import and for the contrary case where this latter process dominates. A method for obtaining the parameters for layers of finite thickness from data on very thin layers is presented. The expansion used for the case where multiple scattering dominates is illustrated by consideration of a thick non-absorbing neutron shield of high atomic weight. The physical significance of the expansion coefficients introduced is determined. NACA TN 2647.

MAXIMUM ALLOWABLE CONCENTRATIONS OF FISSION PRODUCTS IN THE AIR AS A FUNCTION OF EXPOSURE TIME AND TIME AFTER DETONATION (CONTINUED), by Robert L. Harvey. U. S. Chemical Corps. Chemical and Radiological Laboratories, Army Chemical Center, Maryland. Jan 1952. 19p graphs, tables Microfilm $1.75, Photostat $2.50. PB 106344

In this paper, some of the assumptions have been modified, the calculations have been refined, and the presence of plutonium is considered. A new graph has been prepared showing maximum permissible concentrations up to 50 times greater. Project 4-12-10-002, Interim report. In effect this report supersedes CRL IR 64 (PB 105760). CC CRL IR 81.

PRINCIPLE OF DETAILED BALANCING IN ATOMIC AND NUCLEAR PHYSICS, by J. David Jackson. National Research Council of Canada. Atomic Energy Project. Aug 1951. 34p graph Available from National Research Council of Canada, Ottawa, Canada. $.25. PB 106295

1. Nuclear physics - Research - Canada 2. Atomic power - Research - Canada 3. Quantum mechanics - Canada 4. Quantum theory - Canada 5. Radiation absorption - Canada 6. NRCC AEP LT-32 7. NRCC 2610.

Contents: Part A: Detailed balancing in atomic physics. Part B: Detailed balancing in nuclear physics.

RADIOAUTOGRAPHIC METHOD FOR EXAMINING DISTRIBUTION OF PARTICLES IN A CYCLOTRON BEAM, by M. L. Pool and S. Fultz. U. S. National Advisory Committee for Aeronautics. Mar 1952. 20p photos, graphs, tables Microfilm $1.75, Photostat $2.50. PB 106527

The relative distribution of particles emitted from activated metal foil has been obtained by the use of radioautographs of the foil, and hence the time-averaged distribution of particles in the cyclotron beam which causes activation of the foil can also be obtained. This has been established for Kodak Super Pan Press B film provided the maximum photographic density of the radioautograph is kept below 1.1. The method has been confirmed by direct comparison of density values and count rates and has also been verified for higher energy components of the β -rays emitted from the foils. NACA TN 2650.

RECENT DEVELOPMENTS IN BETA-DECAY THEORY AND THE INTERACTION BETWEEN PARTICLES OF SPIN ONE-HALF, by M. A. Preston. National Research Council of Canada. Atomic Energy Project. Aug 1951. 31p tables Available from National Research Council of Canada, Ottawa, Canada. $.20. PB 106292

1. Beta rays - Emission - Canada 2. Atomic power - Research - Canada 3. NRCC AEP LT-33 4. NRCC 2611.

TOTAL LINEAR ABSORPTION COEFFICIENTS OF VARIOUS TYPES OF MEDIA FOR GAMMA RADIATION, by John A. Pierce and Paul M. James. U. S. Chemical Corps. Chemical and Radiological Laboratories, Army Chemical Center, Maryland. Nov 1951. 34p diagrs, graphs, tables Microfilm $2.25, Photostat $5.00. PB 106336

The purpose of this experiment is to determine the total absorption coefficients of various materials for which no data is available in the literature. Project 4-12-01-002, Interim report. CC TCR 591.

PRINTING, PUBLISHING AND ALLIED INDUSTRIES

LETTERPRESS PRINTING. REPORT OF A VISIT TO THE U.S.A. IN 1950 OF A PRODUCTIVITY TEAM REPRESENTING THE LETTERPRESS PRINTING INDUSTRY. Anglo-American Council on Productivity. Feb 1951. 85p photo, drawings, tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.65. PB 106418

1. Printing.

LITHOGRAPHIC PRINTING. REPORT OF A VISIT TO THE U.S.A. IN 1951 OF A PRODUCTIVITY TEAM REPRESENTING THE BRITISH LITHOGRAPHIC PRINTING INDUSTRY. Anglo-American Council on Productivity. Oct 1951. 143p photos, drawings (1 fold), tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $1.25. PB 106416

1. Lithography.

PSYCHOLOGY

ACCURACY OF SHAPE DISCRIMINATION AS A FUNCTION OF THE RANGE OF EXPOSURE INTERVALS, by Malcolm D. Arnoult. U. S. Air Training Command. Human Resources Research Center. Perceptual and Motor Skills Research Laboratory, Lackland Air Force Base, San Antonio, Texas. Dec 1951. 14p drawing, graphs, tables Microfilm $1.75, Photostat $2.50. PB 106378

This study was directed toward investigating a common method of measuring performance in shape discrimination; namely, the minimum length of exposure required to make given discriminations. The results indicated that when the two shapes being compared were different the accuracy of discrimination increased with an increase in exposure time. These findings indicate important limitations in the use of minimum exposure intervals as a measure of shape discrimination. Moreover, the results suggest important hypotheses with respect to the psychological processes involved in shape discrimination. These hypotheses are suggestive with respect to the orientation of future research. Project no. 509-019-0001. AAF HRRC RB 51-32.

ATTITUDES OF AIR TRAINING COMMAND AIRMEN TOWARD VARIOUS ASPECTS OF AIR FORCE LIFE, by Charles E. Zeleny and Robert G. Smith, Jr. U. S. Air Training Command. Human Resources Research Center. Technical Training Research Laboratory, Chanute Air Force Base, Illinois. Dec 1951. 25p graphs Microfilm $2.00, Photostat $3.75. PB 106377

1. Personnel, Flying - Psychological records 2. Psychological research 3. AAF HRRC RB 51-31.

Project no. 507-009-0003.

DECREMENTS AND RECOVERY FROM DECREMENTS IN A SIMPLE WORK TASK WITH VARIATION IN FORCE REQUIREMENTS AT DIFFERENT STAGES OF PRACTICE, by Edward A. Bilodeau. U. S. Air Training Command. Human Resources Research Center. Perceptual and Motor Skills Research Laboratory, Lackland Air Force Base, San Antonio, Texas. Dec 1951. 8p graphs, tables Microfilm $1.25, Photostat $1.25. PB 106549

1. Motor reactions - Measurement 2. AAF HRRC RB 51-34.

Project no. 509-020-0001.

EFFECTS OF STRATEGIC BOMBING ON GERMAN MORALE, VOL. II. U. S. Strategic Bombing Survey. Dec 1946. 69p tables Microfilm $3.00, Photostat $8.75. PB 106510

1. Bombing, Strategic - Germany 2. Bombing, Strategic - Psychological effects - Germany.

TECHNICAL REPORT, by Henry A. Imus. Gt. Brit. Medical Research Council. Applied Psychology Research Unit. Nov 1951. 32p Microfilm $2.25, Photostat $5.00. PB 106550

The research covers experiments on thinking and perceiving, skilled muscular movements, visual display problems, effects of abnormal environments, synthetic training, and road research problems. ONRL TR 119-51.

RUBBER AND RUBBER PRODUCTS

REPORT OVER STATE OF RESEARCH WORK ON ACTIVATION OF BUNA-S POLYMERIZATION, BY DR. LEGEMANN. PREPARED by Sherlock Swann, Jr. and B. M. Elias. Oct 1945. 31f tables Microfilm $2.25, Enlargement Print $6.25. PB 106519

1. Buna S (Trade name) 2. Polymerization - Acceleration - Research - Germany 3. TIIC CS 15.

STRUCTURAL ENGINEERING

ANALOGY BETWEEN ELASTIC SOLIDS AND VISCOUS LIQUIDS, by V. G. Szebehely and D. H. Pletta. Virginia. Engineering Experiment Station, Blacksburg, Va. Nov 1951. 27p diagr Available from Engineering Experiment Station, Virginia Polytechnic Institute, Blacksburg, Va. $.25. PB 106313

1. Liquids, Viscous 2. Solids, Elastic-plastic 3. VEES B80.

Virginia Polytechnic Institute Publications, vol. XLV, no. 1.

COMPRESSIVE BUCKLING OF FLAT RECTANGULAR METALITE TYPE SANDWICH PLATES WITH SIMPLY SUPPORTED LOADED EDGES AND CLAMPED UNLOADED EDGES (REVISED) by Paul Seide. U. S. National Advisory Committee for Aeronautics.

Feb 1952. 27p diagrs, graphs, tables Microfilm $2.00, Photostat $3.75. PB 106349

A theoretical solution is obtained for the problem of the compressive buckling of flat rectangular Metalite-type sandwich plates with simply supported loaded edges and clamped unloaded edges. The solution is based upon the general small-deflection theory for flat sandwich plates developed in NACA Rep. 899. Supersedes TN 1886. NACA TN 2637.

DERIVATION OF TWO-FIVE-MOMENT THEOREMS FOR CONTINUOUS PLANE CURVED BEAMS, by Mervin B. Hogan. Utah. Engineering Experiment Station. Dept. of Mechanical Engineering. Apr 1947. 23p diagrs Available from The Director, Utah Engineering Experiment Station, University of Utah, Salt Lake City, Utah. PB 106046

This paper presents the derivation of two equations relating the bending and twisting moments existing at the five consecutive supports of four continuous spans of a circular curved beam, of uniform flexural and torsional rigidity, loaded normal to its plane of curvature. One expression contains only the bending moments and relates them to the loading, while the other relation is in terms of only the twisting moments and likewise expresses them as a function of the loading. These two-five moment theorems are given for the case of an arbitrarily placed concentrated load on each of the four spans and also for uniformly distributed loads over the entire length of each span. Bulletin of the University of Utah, vol. 36, no. 11. UU EES B31.

FIRE ENDURANCE OF TIMBER BEAMS AND FLOORS, by D. I. Lawson, C. T. Webster and L. A. Ashton. Gt. Brit. Dept. of Scientific and Industrial Research and Gt. Brit. Fire Offices' Committee. 1951. 13p photos, graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.30. PB 106363

1. Beams, Timber - Fire resistance - Gt. Brit. 2. DSIR NB B13.

S. O. Code no. 47-549-13.

INFLUENCE CHARTS FOR COMPUTATION OF STRESSES IN ELASTIC FOUNDATIONS, by Nathan M. Newmark. Illinois. Engineering Experiment Station, Urbana, Illinois. May 1951. 29p diagrs (part fold) tables Available from Engineering Experiment Station, University of Illinois, Urbana, Ill. $.35. PB 106538

1. Foundations - Stresses - Calculations 2. Shear stress - Calculations 3. Stresses - Calculations 4. ILU EES B338.

University of Illinois bulletin vol. 48, no. 66.

INTERACTION OF COLUMN AND LOCAL BUCKLING IN COMPRESSION MEMBERS, by P. P. Bijlaard and G. P. Fisher. U.S. National Advisory Committee for Aeronautics. Mar 1952. 110p photos, diagrs, graphs, tables Microfilm $4.50, Photostat $13.75. PB 106615

Simple formulas are obtained which express the actual buckling stress directly in terms of the column or plate buckling stresses. Columns with box, I-, H-, and T-sections and angles are considered separately. Interaction of practically significant magnitude occurs only in cases of flexural and torsional buckling. In these cases the additional effect of distorsion of the cross section is also taken into account. The theory includes buckling in the plastic range. Tests were carried out for a considerable range of ratios of corrected free length to radius of gyration on two sections, for one of which the local buckling stress was in the plastic, and for the other, in the elastic, domain. The experimental buckling stresses are in excellent agreement with those predicted by the theory. NACA TN 2640.

INVESTIGATION OF STRESS DISTRIBUTION IN RECTANGULAR PLATES WITH LONGITUDINAL STIFFENERS UNDER AXIAL COMPRESSION AFTER BUCKLING, by Chi-Teh Wang and Harry Zuckerberg. U. S. National Advisory Committee for Aeronautics. Mar 1952. 61p graphs, diagrs Microfilm $3.00, Photostat $8.75. PB 106620

An investigation was carried out to study the elastic behavior after buckling of a rectangular plate reinforced with longitudinal stiffeners and subjected to compressive loads in a direction parallel to the stiffeners. Two possible buckling modes were investigated, namely, that in which the plate buckles around the stiffeners as nodal lines and that in which the plate buckles with the intermediate stiffeners as a unit. For the first buckling mode the calculated results were compared with experimental results and the agreement was found to be good. The method of analysis used is a modified variational procedure; this was found to give much better results with the same amount of computational labor. NACA TN 2671.

INVESTIGATION OF THE PRESSURE CHARACTERISTICS AND AIR DISTRIBUTION IN BOX-TYPE PLENUMS AIR CONDITIONING DUCT SYSTEMS. REPORT OF AN INVESTIGATION CONDUCTED BY THE ENGINEERING EXPERIMENT STATION, UNIVERSITY OF ILLINOIS, IN COOPERATION WITH THE AMERICAN GAS ASSOCIATION by Stanley F. Gilman, Ross J. Martin and Seichi Konzo. Illinois. Engineering Experiment Station, Urbana, Illinois. Jul 1951. 77p photo, drawings, graphs, tables Available from Engineering Experiment Station, University of Illinois, Urbana, Illinois. $.80. PB 106539

1. Air conditioning - Equipment 2. Ducts, Air - Design 3. ILU EES B393.

University of Illinois bulletin vol. 48, no. 79.

INVESTIGATION OF THE STRUCTURAL DAMPING OF A FULL-SCALE AIRPLANE WING, by Dwight O. Fearnow. U. S. National Advisory Committee for Aeronautics. Feb 1952. 11p photo, diagr, graphs, table Microfilm $1.75, Photostat $2.50. PB 106347

An investigation to determine the structural damping characteristics of a full-scale airplane wing was conducted by the shock-excitation method wherein the wing was loaded to a predetermined deflection and the load suddenly released. The test specimen vibrated at its fundamental bending frequency of 1.69 cycles per second. Only the first 2 or 3 cycles showed any indication of a higher frequency being superimposed upon the fundamental bending frequency. The damping was found to increase from about 0.002 of critical at an amplitude of vibration of $\pm$0.05 inch to approximate-

ly 0.006 of critical at an amplitude of ±5 inches. NACA TN 2594.

INVISCID FLOW ABOUT AIRFOILS AT HIGH SUPERSONIC SPEEDS, by A. J. Eggers, Jr. and Clarence A. Syvertson. U. S. National Advisory Committee for Aeronautics. Mar 1952. 64p diagrs, graphs, table Microfilm $3.00, Photostat $8.75. PB 106350

The flow about curved airfoils is investigated analytically at high supersonic speeds assuming air behaves first as an ideal, and then as a calorically imperfect gas. For ideal gas flows it is shown that the shock-expansion method accurately predicts pressure distributions on curved airfoils at arbitrarily high Mach numbers provided the flow deflection angles are not too close to those corresponding to shock detachment. Forms of the shock-expansion method and the method of characteristics, generalized to consider the caloric imperfections of air and applicable for local air temperature up to 5000°R are obtained and investigated. This shock-expansion method also exhibits a wide range of applicability and is shown to be useful in calculating the entire flow field about an airfoil. High Mach number approximations to both shock-expansion methods are investigated and presented in forms suitable for application to engineering problems. NACA TN 2646.

LIMIT ANALYSIS OF ARCHES, by E. T. Cnat and W. Prager. Brown University. Graduate Division of Applied Mathematics, Providence, R. I. Feb 1952. 25p diagrs Microfilm $2.00, Photostat $3.75. PB 106306

In the limit analysis of frames, it is usually assumed that the limiting bending moment of a cross section is not significantly reduced by the presence of axial forces. In the limit analysis of flat arches; this assumption is not permissible as a rule. In the present paper, the basic concepts of limit analysis are extended to members in which axial forces as well as bending moments must be taken into account. Methods of determining the critical load intensity of arches are developed and illustrated by numerical examples. Contract N7onr-35801, NR-041-032. GDAM TR 69. GDAM A11-69/25.

LIMIT DESIGN OF PLATES: THE UPPER BOUND FOR THE SAFETY FACTOR, by W. E. Pell. Brown University. Graduate Division of Applied Mathematics, Providence, R. I. Jan 1952. 25p diagrs Microfilm $2.00, Photostat $3.75. PB 106305

In the present paper the determination of an upper bound is considered for a plate of the same material as above, supported and loaded in the same way. The boundary curve is taken to be any convex, simple, closed curve. In the limit design of plates the expression for the upper bound is obtained in terms of a rate of deflection which plays a role analogous to that of the deflection of the middle surface in the classical theory of elastic thin plates. In general, the function describing the rate of deflection surface is such that analytic evaluation of the expression for the upper bound is impossible. It is found that this expression can, however, be evaluated analytically in case the rate of deflection surface is composed of portions of developable surfaces. Such a surface cannot possess the continuity properties assumed in the original extremum theorems, and the expression for the upper bound is modified to take cognizance of this fact. Contract N7onr-35801, T. O. I, NR-041-032. GDAM A11-66/25. GDAM TR 66.

MOMENT DISTRIBUTION APPLIED TO COMBINED FLEXURE AND TORSION, by Mervin B. Hogan. Utah. Engineering Experiment Station. Dept. of Electrical Engineering. Feb 1945. 39p graphs, tables Available from The Director, Utah Engineering Experiment Station, University of Utah, Salt Lake City, Utah. PB 106043

The present work deals with the application of the method of moment distribution to problems of combined flexure and torsion. Complete solutions are presented of a built-in circular beam with (1) a concentrated load acting normal to the plane of curvature at any point on the center line of the beam; (2) a uniformly distributed load over the entire length of the beam; (3) a bending moment applied at any cross section of the beam; and (4) a twisting moment acting at any cross section of the beam. Also evaluated are the stiffness, carry-over, and accompainment factors necessary in the solution of combined flexure and torsion problems by this method. Curves are included with the above solutions which graphically present the analytical expressions for a steel beam of three different cross sectional forms. Several illustrative examples are also included which indicate the detailed application of the moment distribution principle. Bulletin of the University of Utah, vol. 35, no. 16. UU EES B26.

PERFORMANCE OF A GAS-FIRED FORCED-AIR HEATING SYSTEM IN RESEARCH RESIDENCE NO. 1, by Seichi Konzo, George H. Green, Robert W. Roose, Morris E. Childs. Illinois. Engineering Experiment Station, Urbana, Illinois. Dec 1951. 47p photo, drawings, diagr, graphs, tables Available from Engineering Experiment Station. University of Illinois, Urbana, Ill. $.60. PB 106541

1. Heating equipment, Domestic 2. Houses - Heating - Research 3. ILU EES B397.

University of Illinois bulletin vol. 49, no. 31. Report of an investigation conducted by the Engineering Experiment Station, University of Illinois in cooperation with the National Warm Air Heating and Air Conditioning Association; data compiled under auspices of American Gas Association.

PLASTIC DEFORMATION OF RECTANGULAR PLATES UNDER DIRECT LOADS, by H.G. Hopkins. Brown University. Graduate Division of Apolied Mathematics, Providence, R. I. Feb 1952. 57p Microfilm $2.75, Photostat $7.50. PB 106367

A plastic flow theory is given of the small deformation of rectangular plates of work-hardening material obeying the Mises yield criterion under uniform direct loads applied to all edges. Contract N7onr-35801, T. O. I, NR-041-032. GDAM A11-67/57. GDAM TR 67.

PRINCIPLE AND APPLICATION OF COMPLEMENTARY ENERGY METHOD FOR THIN HOMOGE-

NEOUS AND SANDWICH PLATES AND SHELLS WITH FINITE DEFLECTIONS, by Chi-Teh Wang. U. S. National Advisory Committee for Aeronautics. Feb 1952. 33p diagrs Microfilm $2.25, Photostat $5.00. PB 101325

The principle of complementary energy in the nonlinear elasticity theory is shown to be derivable from the principle of potential energy by a Legendre type of transformation. In particular, the expression of the complementary energy is derived for homogeneous and sandwich plates and shells with large deflections. By the method of complementary energy, the stress-strain relations are derived for homogeneous shells, sandwich plates, and sandwich shells. Without the use of this method much lengthier calculations would be necessary. NACA TN 2620.

REMARKS ON THE COMBINED BENDING AND TWISTING OF THIN TUBES IN THE PLASTIC RANGE, by E. T. Onat and R. T. Shield. Brown University. Graduate Division of Applied Mathematics, Providence, R. I. Feb 1952. 15p graphs Microfilm $1.75, Photostat $2.50. PB 106368

The influence of the loading program on the agreement between the predictions of the Hencky and the Prandtl-Reuss stress-strain relations for a perfectly plastic material is investigated in the case of the combined bending and twisting of thin-walled tubes. The agreement in the values of the bending and twisting moments is found to vary considerably with the particular loading program chosen. The analysis is extended to tubes composed of a work-hardening material. The bending and twisting moments are obtained numerically using the incremental approach for a square tube which is bent and then twisted. Owing to the large amount of labor involved in this solution, an approximate method using the concept of a "composite" beam is developed, and good agreement in the results is found with those obtained from the incremental solution. Contract N7onr-35801, NR-041-032. GDAM TR 70. GDAM A11 70/15.

SOLUTION OF CLOSED CIRCULAR RINGS BY THE CONJUGATE RING METHOD, by Mervin B. Hogan. Utah. Engineering Experiment Station. Dept. of Mechanical Engineering. Jan 1948. 48p diagrs, graphs Available from The Director, Utah Engineering Experiment Station, University of Utah, Salt Lake City, Utah PB 106047

The present paper makes available to engineers a method of solution for closed circular rings based on the use of a so-called "conjugate ring". The method has the virtue of simplifying the solution of ring problems involving both loading in the plane of the ring and loading normal to the ring's plane. After establishing the validity of introducing the "conjugate ring" in each of the two foregoing cases of loading, the application of the method to specific examples of the two systems of loading is illustrated and the solutions of these problems presented. Bulletin of the University of Utah, vol. 38, no. 14. UU EES B36.

STRESS ANALYSIS IN A MODEL PIPE HANGER, by Oswald A. Drica-Minieris. Louisiana. Engineering Experiment Station, Baton Rouge, La. 1952. 26p photos, drawings, graphs, tables Available from Engineering Experiment Station, Louisiana State University, Baton Rouge 3, La. PB 106384

1. Oil wells - Casing heads - Stresses 2. Pipe - Stresses 3. Stress analysis 4. L EES B27.

STRESSES AND DEFORMATIONS IN WINGS SUBJECTED TO TORSION, by B. F. Ruffner and Eloise Hout. U. S. National Advisory Committee for Aeronautics. Feb 1952. 79p diagrs, graphs, tables Microfilm $3.50, Photostat $10.00. PB 100977

Basic equations of Kármán and Chien are solved by representing the shape of a torsion box by means of a Fourier series. Coefficients of the series are determined by conventional methods. Angles of twist, longitudinal stresses, and shear stresses are determined in terms of the series coefficients. The method is applied to the calculation of angles of twist and stresses in torsion boxes of rectangular, elliptical, and airfoil cross section. Results obtained for angles of twist and normal stresses are in good agreement with results of Kármán and Chien except at sharp corners. Results obtained for shear stresses indicate the necessity for use of a large number of terms of the series for satisfactory accuracy. NACA TN 2600.

TEXTILES AND TEXTILE PRODUCTS

COTTON WEAVING. REPORT OF A VISIT TO THE U.S.A. IN 1949 OF A PRODUCTIVITY TEAM REPRESENTING THE COTTON WEAVING INDUSTRY. Anglo-American Council on Productivity. Jun 1950. 70p map Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D.C. $.50. PB 106439

1. Textile industry 2. Textile machines 3. Textile mills.

MINUTES OF MEETINGS, 1ST-9TH, AUG 1, 1946-OCT 14, 1948, AND SUMMARY OF TOPICS PRESENTED AT THE JOINT MEETING OF THE TEXTILES AND CORDAGE SUBCOMMITTEE AND FUNGICIDE SUBCOMMITTEE, JAN 19, 1949. U. S. Joint Army-Navy Deterioration Prevention Committee. Fungicide Subcommittee. Aug 1946-Jan 1949. 86p Available from National Research Council, 2101 Constitution Ave., Washington 25, D. C. PB 105952

1. Fungicides - Tests.

TRANSPORTATION EQUIPMENT

Aeronautics

Aircraft

APPROXIMATE THEORY FOR CALCULATION OF LIFT OF BODIES, AFTERBODIES, AND COMBINATIONS OF BODIES, by Barry Moskowitz. U. S. National Advisory Committee for Aeronautics. Apr 1952. 39p diagrs, graphs Microfilm $2.25, Photostat $5.00. PB 106630

An expression is developed for the lift of a slender afterbody in terms of the" slender-body" approxi-

mate potential at the after end in conjunction with a suitably calculated value of the potential at the forward end. The failure of the usual "slender-body" theory to predict any lift on a slender cylindrical afterbody is thereby corrected. The same expression is used to compute the part of the interference lift generated by the presence of a neighboring body, due to the interference upwash. Another expression is developed to compute the remainder of the interference lift, due to an interference pressure gradient. The lift is determined for a cone-cylinder body, a cylindrical afterbody of a slender wing-body combination, and three combinations of bodies to illustrate the method. NACA TN 2669.

CHARTS FOR EVALUATING ROLLING PERFORMANCE, by Bernard Etkin. Canada. National Aeronautical Establishment. 1951. 12p graphs, tables Microfilm $1.75, Photostat $2.50. Limited supply available free from The National Aeronautical Establishment, Montreal Road, Ottawa, Canada.

PB 106573

1. Airplanes - Rolling - Charts - Canada 2. Rolling moments - Charts - Canada 3. NAEC R 13.

COMPARISON OF THEORY AND EXPERIMENT FOR HIGH-SPEED FREE-MOLECULE FLOW, by Jackson R. Stalder, Glen Goodwin and Marcus O. Creager. U. S. National Advisory Committee for Aeronautics. 1951. 24p photos, drawings, graphs, tables Available from Superintendent of Documents, Government Printing Office, Washington 25, D. C. $.25.

PB 106633

A comparison is made of free-molecule-flow theory with the results of wind-tunnel tests performed to determine the drag and temperature-rise characteristics of a transverse circular cylinder. The measured values of the cylinder center-point temperature confirmed the salient point of the heat-transfer analysis which was the prediction that an isulated cylinder would attain a temperature higher than the stagnation temperature of the stream. Good agreement was obtained between the theoretical and the experimental values for the drag coefficient. NACA 1032. NACA TN 2244, revised.

DESIGNING TO AVOID DANGEROUS BEHAVIOUR OF AN AIRCRAFT DUE TO THE EFFECTS ON CONTROL HINGE MOMENTS OF ICE ON THE LEADING EDGE OF THE FIXED SURFACE, by D. E. Morris. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Mar 1947. 10p diagrs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.45. PB 106372

The results of wind tunnel measurements of the hinge moments of a Viking elevator with simulated ice on the tailplane leading edge are used to explain uncontrollable pitching oscillations of the aircraft which occurred during a flight with ice on the tailplane leading edge. Reference is made to theoretical reports which show that with certain elevator (or rudder) hinge moment characeteristics increasing oscillations in pitch (or yaw) are obtained. It is suggested that the imposing of certain limitations on the control surface hinge moment coefficients will eliminate the possibility of a repetition of the Viking incident on future aircraft designs. In order to achieve this it is recommended that for elevators and rudders the value of $-b_2$ should not be less than 0.10 (0.12 if they have an unshielded horn balance). For ailerons it is recommended that $-b_2$ should not be less than 0.075. The value of the elevator b_1 should be such that the stick free neutral point is not more than 0.05c aft of the stick fixed neutral point. For rudders the value of b_1 should be designed to be less than 0.05. It is suggested that tests should be put in hand to determine the accuracy with which b_2 for an elevator can be measured in flight during quick routine tests. Should it prove practicable to obtain the needed accuracy, consideration should be given to framing a definite requirement for a lower limit for $-b_2$ on elevators with possible an escape clause in certain cases, e.g. for power operated controls. Cover date is 1952. S. O. code no. 23-9006-66. ARC CP 66.

EFFECTS OF WING LIFT AND WEIGHT ON LANDING-GEAR LOADS, by Dean C. Lindquist. U. S. National Advisory Committee for Aeronautics. Mar 1952. 42p photo, diagr, graphs, table Microfilm $2.50, Photostat $6.25. PB 106555

The effects of wing lift and weight on maximum landing gear loads were investigated by drop testing a small landing gear with an oleo shock strut in the Langley impact basin. Lift forces were mechanically applied to the dropping mass to produce wing lift factors between 0 and 2.0. Dropping weight ranged between 1000 and 2500 pounds. The results show the relationship between lift force, weight, and landing-gear loads for a range of vertical velocities between 0 and 12 feet per second. NACA TN 2645.

GENERALIZED LINEARIZED CONICAL FLOW, by W. D. Hayes, R. C. Roberts and N. Haaser. U.S. National Advisory Committee for Aeronautics. Mar 1952. 48p diagrs, graphs, tables Microfilm $2.50, Photostat $6.25. PB 106616

A basic theory of generalized linearized supersonic conical flow for both inside and outside the Mach cone was developed and applied to several specific problems including unsteady-flow conditions. A triangular lifting wing in pitching and rolling with both subsonic and supersonic leading edges was investigated and pressure coefficients were obtained. A family of thin sweptback triangular wings having symmetrical thickness distribution was also investigated and analytic expressions for wave drag and pressure coefficients were determined. Values of wave-drag coefficients were calculated and the results presented graphically. NACA TN 2667.

HIGH-SPEED SUBSONIC CHARACTERISTICS OF 16NACA 6-SERIES AIRFOIL SECTIONS, by Milton D. Van Dyke. U. S. National Advisory Committee for Aeronautics. Mar 1952. 64p diagrs, graphs, tables Microfilm $3.00, Photostat $8.75.

PB 106617

High-speed subsonic characteristics have been measured for NACA 63-, 64-, 65-, and 66-series airfoil sections having thickness ratios of 6, 8, 10 and 12 percent and an ideal lift coefficient of 0.2. For given thickness ratio, airfoil sections with minimum pressure near 40-percent chord exhibit the best over-all aerodynamic characteristics. For

even the thinnest sections, good high-speed performance is maintained over a wide range of lift coefficient. NACA TN 2670.

INTERFERENCE ON A WING DUE TO A BODY AT SUPERSONIC SPEEDS, by S. Kirkby and A. Robinson. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Apr 1947. 10p diagrs, graphs Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.75. PB 106370

The increment in lift due to wing-body interference at supersonic-speeds is calculated approximately for an untapered wing, without sweep-back. The wing-body combination considered consists of a right-circular conical body, of small semi-vertical angle, carrying an unswept symmetrical rectangular wing whose chord is inclined at a small angle to the axis of the body cone. In the present approximate theory the conical body is replaced by an axial doublest system and the upwash velocity increment is calculated at the mid-chord line of the wing. The resultant lift increment on the wing due to body interference is then calculated by Ackeret's theory. Curves are plotted to show the variation of induced wing-lift coefficient with cone angle for different wing positions. Cover data is 1952. S. O. Code no. 23-2500. ARC RM 2500.

INVESTIGATION OF SPOILER AILERONS FOR USE AS SPEED BRAKES OR GLIDE-PATH CONTROLS ON TWO NACA 65-SERIES WINGS EQUIPPED WITH FULL-SPAN SLOTTED FLAPS, by Jack Fischel and James M. Watson. U. S. National Advisory Committee for Aeronautics. 1951. 26p diagrs, graphs Available from Superintendent of Documents, Government Printing Office, Washington 25, D. C. $.25. PB 106635

Contains results and discussion of an investigation of plug and retractable ailerons used as speed brakes or glide-path controls on an NACA 65-210 wing and an NACA 65_2-215 wing of aspect ratio 5.76 equipped with full-span slotted flaps. Incremental lift, drag, and pitching-moment data are presented for various flap conditions through a large angle-of-attack range at Mach numbers from 0.13 to 0.71. Analysis indicates that this use of spoiler ailerons is feasible and desirable for normal or emergency operation of airplanes. These speed brakes or glide-path controls would probably have small effect on wing pitching moments and should retain their rolling effectiveness. Supersedes NACA TN 1933 (PB 98912). NACA Rept. 1034. NACA TN 1933, revised.

MEASUREMENTS OF THE PRESSURE DISTRIBUTION ON RECTANGULAR WINGS OF DIFFERENT ASPECT RATIOS, by Olof A.M. Holme. Flygtekniska Försöksanstalten (FFA) Stockholm. Jul 1950. 27p photos, graphs Microfilm $2.00, Photostat $3.75. PB 106401

Measurements of the pressure distribution on rectangular wings of aspect ratios ranging from 0.52 to 4.50 have been made with semispan models in the 3.60 m low-speed tunnel of FFA. From the results of the measurements the following properties of the wings have been computed: a) the pressure distribution at zero incidence b) the section normal-force coefficients and the section center of pressure positions at different angles of attack c) the normal force coefficient and the centre of pressure position of the wing at different angles of attack. The minimum pressure at zero incidence was found to decrease in magnitude with the aspect ratio. The section normal-force coefficients and the section centre of pressure positions at small angles of attack agreed fairly well with the predictions of linear lifting-surface-theory for all the aspect ratios, but as the angle of attack increased the normal-force distribution became more concentrated towards the tips and the centre of pressure at the tips moved backwards, the phenomena being more pronounced for the smaller aspect ratios. The lift-curve slope and the centre of pressure position of the wings at small angles of attack also agreed with the results of theory and for aspect ratio ≥ 3 the agreement held up to the stall. For the smaller aspect ratios, however, the lift-curve slope increased and the centre of pressure moved backwards as the angle of attack increased. FFA no. 37.

MUSTANG AND HARVARD AIRCRAFT PROTOTYPE INSTALLATION ADAPTER AIRCRAFT ROCKET LAUNCHER MK 6 MOD O, by J. G. Begg. Canada. Royal Canadian Air Force. Experimental and Proving Establishment, Rockcliffe, Canada. May 1951. 41p photos, drawings, tables Microfilm $2.50, Photostat $6.25. PB 106592

1. Launching sites, Rocket - Canada 2. Adapters, Rocket launcher - Canada 3. Rocket launchers, Aircraft - Canada 4. Mustang (Airplane) 5. Harvard 2B (Airplane) 6. MK 6 Mod O (Aircraft rocket launcher adapter). 7. RCAF EPE 957.

Cover date is March 1952. RCAF Development report: Final C/1 ARM 5. Reference: AMTS directive number 18-49 dated 12 November 1949. Issued by AMTS.

STUDY OF INADVERTENT SPEED INCREASES IN TRANSPORT OPERATION, by Henry A. Pearson. U. S. National Advisory Committee for Aeronautics. Mar 1952. 29p graphs, table Microfilm $2.00, Photostat $3.75. PB 106554

Some factors relating to the speed and Mach number margins required in operation of transport airplanes are discussed for the purpose of indicating how these margins should vary with the airplane qualities. Most of the cases investigated show that on a percentage basis smaller margins should be required of the faster airplane than the slower airplane. Equations are suggested which allow these margins to be estimated. NACA TN 2638.

TEXAN T6D HANDLING CHARACTERISTICS, by N. D. Bray and E. A. Bernard. Canada. Royal Canadian Air Force. Experimental and Proving Establishment, Rockcliffe, Canada. Feb 1952. 17p graphs, tables Microfilm $1.75, Photostat $2.50. PB 106358

An assessment of the handling characteristics of the Texan aircraft has been made, and a comparison of the stick force per g for the Texan and the Harvard 2 has been obtained. No significant difference in handling qualities was noted, and the Harvard rear CG limit of 33.26 inches aft of the leading edge of the wing (LEW) is recommended for the Texan. Although the stick force per g is within the range applicable to this type of aircraft, it is pointed out that forces great

enough to exceed airframe limitations can easily be exerted by the pilot when the CG is at or near the aft limit, which condition exists when the rear seat is occupied. RCAF EPE 981.

THEORETICAL CALCULATION OF THE DOWNWASH FACTOR FOR UNSWEPT TRAPEZOIDAL WINGS WITH REGARD TO THE COMPRESSIBILITY FOR SUBSONIC VELOCITIES, by W. Jacobs. Flygtekniska Försöksanstalten (FFA) Stockholm. 1950. 20p diagr, graphs Microfilm $1.75, Photostat $2.50. PB 106402

For the important class of the trapezoidal wings the downwash factor was calculated, changing systematically the aspect ratio and the taper ratio of the wing and the position of the horizontal tail behind the wing. The results are represented by diagrams. Also the influence of the compressibility on the downwash factor can be calculated from the diagrams. FFA no. 38.

Engines and Propellers

EFFECT OF MACH NUMBER ON THE FLOW AND APPLICATION OF COMPRESSIBILITY CORRECTIONS IN A TWO-DIMENSIONAL SUBSONIC-TRANSONIC COMPRESSOR CASCADE HAVING VARIED POROUS-WALL SUCTION AT THE BLADE TIPS, by William B. Briggs. U. S. National Advisory Committee for Aeronautics. Mar 1952. 43p photos, diagrs, graphs Microfilm $2.50, Photostat $6.25. PB 106526

A 65-(12)10 compressor blade cascade was evaluated at design geometry for Mach numbers from 0.12 to 0.89 with the boundary layer controlled through up-stream slots and porous walls. The suction control was specified by a two-dimensionality criterion. The data show the effect of Mach number on turning angle, blade wake, blade profile pressure distribution, and static-pressure rise. The influence of suction on these parameters and secondary losses is illustrated. A system for correlating the experimental static-pressure rise with the theoretical is presented. Prandtl-Glauert and Kármán-Tsien compressibility correction predictions are compared with the data. A new method utilizing the vector-mean velocity and the contraction coefficient is presented. NACA TN 2649.

EXPERIMENTAL INVESTIGATION OF TRANSITION OF A MODEL HELICOPTER ROTOR FROM HOVERING TO VERTICAL AUTOROTATION, by S. E. Slaymaker, Robert R. Lynn and Robin B. Gray. U. S. National Advisory Committee for Aeronautics. Mar 1952. 29p diagr, graphs Microfilm $2.00, Photostat $3.75. PB 106556

An experimental investigation was made of the variation of average induced flow around a model helicopter during transition from hovering flight to steady autorotative vertical descent. Test data were obtained from simulated power failures under many different conditions. Results are summarized for variation in disk loading, blade angles, and pitch-change rate and "effective induced velocities" calculated for the various conditions are presented. Comparisons of theoretical and experimental data indicate that conditions peculiar to vertical descent in the transition range cause variations in performance not predicted by the theoretical analysis. NACA TN 2648.

INVESTIGATION OF BENDING-MOMENT DISTRIBUTION ON A MODEL HELICOPTER ROTOR BLADE AND A COMPARISON WITH THEORY, by John R. Meyer, Jr. U. S. National Advisory Committee for Aeronautics. Feb 1952. 91p photos, diagrs, graphs, tables Microfilm $4.25, Photostat $12.50. PB 102418

Bending-moment distributions were measured on a model helicopter rotor blade under hovering and simulated forward-flight conditions. The hinged-blade configuration was tested up to an advance ratio μ of 0.50; the fixed-at-root configuration, up to μ = 0.90. Curves of maximum-bending-moment distribution are presented for all test conditions. Harmonic bending moments were found from a harmonic analysis of data for μ =0.22 and 0.47. Theoretical calculations at μ =0.22 and 0.47 for hinged- and fixed-at-root conditions, respectively, are compared with experimental results and the agreement is reasonable. Experimentally determined resonance peaks are compared with those indicated by theory for three sets of blades of different stiffnesses. Aerodynamic-loading expressions which include the effect of elastic flapping are developed for the fixed-at-root blade and are used in the Goodyear method which is modified for the fixed-at-root condition. NACA TN 2626.

TECHNIQUE APPLICABLE TO THE AERODYNAMIC DESIGN OF INDUCER-TYPE MULTISTAGE AXIAL-FLOW COMPRESSORS, by Melvyn Savage and Loren A. Beatty. U. S. National Advisory Committee for Aeronautics. Mar 1952. 64p diagrs, graphs tables Microfilm $3.00, Photostat $8.75. PB 106614

A method is presented for the preliminary design of high-pressure-ratio multistage axial-flow compressors using the solid-body inducer design in which the first stage has the radial total-temperature distribution required to make the second-stage inlet axial velocity constant radially. The remaining stages have constant power input radially, solid-body average tangential velocities, and radially constant inlet axial velocities. Typical preliminary design calculations are presented for inlet hub-tip ratios of 0.40, 0.50, and 0.60 with weight flows ranging from 20.0 to 32.5 pounds per second per square foot of frontal area and average pressure ratios per stage ranging from 1.28 to 1.38. Some of the effects of specific weight flow, rotational speed, hub-tip ratio, turning angle, and inlet air angle on power input, amount of radial flow, and over-all pressure ratio are investigated. NACA TN 2598.

THEORETICAL AUGMENTATION OF TURBINE-PROPELLER ENGINE BY COMPRESSOR-INLET WATER INJECTION, TAIL-PIPE BURNING, AND THEIR COMBINATION, by Reece V. Hensley. U. S. National Advisory Committee for Aeronautics. Mar 1952. 43p graphs Microfilm $2.50, Photostat $6.25. PB 106621

A theoretical evaluation of the performance of turbine propeller engines with augmentation by water injection, tail-pipe burning, and by their combination

was made. The investigation covered the flight conditions for which each method of augmentation was most suitable for Mach numbers up to 1.1 and altitudes up to 35,000 feet. The variation in augmentation with varying compressor and turbine efficiencies, compressor pressure ratio, and turbine-inlet temperature was calculated. The augmentation with varying ambient temperature and relative humidity was determined and the dependence of the augmentation on the completeness of evaporation during compression was investigated. NACA TN 2672.

THEORETICAL PERFORMANCE OF AN AXIAL-FLOW COMPRESSOR IN A GAS-TURBINE ENGINE OPERATING WITH INLET WATER INJECTION, by Reece V. Hensley. U. S. National Advisory Committee for Aeronautics. Mar 1952. 25p graphs Microfilm $2.00, Photostat $3.75. PB 106618

The performance of an axial-flow compressor operating in a gas-turbine engine with inlet water injection and compressor-outlet saturation was theoretically evaluated. Changes in compressor pressure ratio, compressor efficiency, and compressor work due to water injection were determined for altitudes up to 50,000 feet, Mach numbers up to 2.0, and normal compressor pressure ratios of 4.8, and 16. NACA TN 2673.

THERMODYNAMIC STUDY OF THE TURBINE-PROPELLER ENGINE, by Benjamin Pinkel and Irving M. Karp. U. S. National Advisory Committee for Aeronautics. Mar 1952. 98p diagr, graphs (part fold) Microfilm $4.25, Photostat $12.50. PB 106529

Equations and charts are presented for computing performance parameters of a turbine-propeller engine for any given set of operating conditions and component efficiencies. In order to illustrate some of the turbine-propeller system performance characteristics, the total thrust horsepower per unit mass rate of air flow and the specific fuel consumption are presented for a wide range of flight engine design operating conditions and given design component efficiencies. The performance of a turbine-propeller engine containing a matched set of components is presented for a range of engine operating conditions. The influence of the characteristics of the individual components of off-design-point performance is shown. The flexibility of operation of two turbine-propeller engines is discussed; one engine has a divided turbine system in which the first turbine drives only the compressor and the second turbine independently drives the propeller, and the other engine has a connected turbine system which drives both the compressor and the propeller. NACA TN 2653.

TWO-DIMENSIONAL FLOW ON GENERAL SURFACES OF REVOLUTION IN TURBOMACHINES, by John D. Stanitz and Gaylord O. Ellis. U. S. National Advisory Committee for Aeronautics. Mar 1952. 44p diagr, graphs Microfilm $2.50, Photostat $6.25. PB 106351

A method of analysis is developed for two dimensional flow on general surfaces of revolution in turbomachines with arbitrary blade shapes. The method of analysis is developed for steady, compressible, nonviscous, irrotational flow that is assumed uniform normal to the surfaces of revolution. Incompressible solutions on a mean surface of revolution between the hub and shroud are presented for four flow rates through each of two centrifugal impellers with the same hub-shroud contours but with different blade spacings. In addition, correlation equations are developed whereby the velocity components and the stream function distribution can be predicted for compressible or incompressible flow in straight-bladed impellers only, with any tip speed, flow rate, area variation, blade spacing, and for any flow surface of revolution. NACA TN 2654.

Aerodynamics

ANALYSIS OF LAMINAR FREE-CONVECTION FLOW AND HEAT TRANSFER ABOUT A FLAT PLATE PARALLEL TO THE DIRECTION OF THE GENERATING BODY FORCE, by Simon Ostrach. U. S. National Advisory Committee for Aeronautics. Feb 1952. 46p graphs, tables Microfilm $2.50, Photostat $6.25. PB 103883

A formal and general analysis of the free-convection flow about a flat plate parallel to the direction of the generating body force is made, and velocity and temperature distributions for Prandtl numbers of 0.01, 0.72, 0.733, 1, 2, 10, 100, 1000, and large Grashof numbers are computed. The distributions for Prandtl number of 0.72 compare favorably with experimental values. It is shown that velocities and Nusselt numbers of the same order of magnitude as those associated with forced-convection flows can be obtained under free-convection conditions. A flow and a heat-transfer parameter are derived from which the important physical quantities can be computed. Reasonable agrement is obtained from an approximate theoretical development, experiments, and the present development. NACA TN 2635.

APPLICATION OF A CHANNEL DESIGN METHOD TO HIGH-SOLIDITY CASCADES AND TESTS OF AN IMPULSE CASCADE WITH 90° OF TURNING, by John D. Stanitz and Leonard J. Sheldrake. U. S. National Advisory Committee for Aeronautics. Mar 1952. 65p photos, drawing, graphs, tables Microfilm $3.00, Photostat $8.75. PB 106408

A technique is developed for the application of a channel design method to the design of high-solidity cascades with prescribed velocity distributions as a function of arc length along the blade-element profile. The technique applies to both incompressible and subsonic linearized compressible (ratio of specific heats equal to -1.0), nonviscous, irrotational, fluid motion. An impulse cascade with 90° turning was designed for incompressible flow and was tested at the design angle of attack over a range of down-stream Mach number from 0.2 to choke flow. To achieve good efficiency, the cascade was designed for prescribed velocities with maximum allowable blade loading according to limitations imposed by considerations of boundary-layer separation. NACA TN 2652.

APPLICATION OF TRANSONIC SIMILARITY, by Adolf Busemann. U. S. National Advisory Committee for Aeronautics. Apr 1952. 22p diagrs, graphs Microfilm $2.00, Photostat $3.75. PB 106623

From a review of the different similarity approaches to compressible potential flow, the meaning and limitations of transonic similarity are traced back to their origin. Although the main text deals with the quasi two-dimensional flow, special suggestions for the case of axisymmetrical bodies are added in an appendix. NACA TN 2687.

COMPRESSIBLE-FLOW PLOTTING DEVICE AND ITS APPLICATION TO CASCADE FLOWS, by Willard R. Westphal and James C. Dunavant. U. S. National Advisory Committee for Aeronautics. Apr 1952. 21p photos, diagrs, graphs, tables Microfilm $2.00, Photostat $3.75. PB 106622

A simplified method has been devised for the solution of two-dimensional compressible flows through well-defined passages. This method makes use of plastic cams which automatically set the length-to-width ratio of rectangles formed by streamlines and equipotential lines represented by spring-steel wires. Pressure distribution around four cascades of turbine blades and along the surface of a choked nozzle determined by this method are shown to compare well with experimental results. NACA TN 2681.

CRITICAL STUDY OF INTEGRAL METHODS IN COMPRESSIBLE LAMINAR BOUNDARY LAYERS, by Paul A. Libby, Morris Morduchow and Martin Bloom. U. S. National Advisory Committee for Aeronautics. Mar 1952. 40p graphs, tables Microfilm $2.25, Photostat $5.00. PB 106557

A number of the most promising integral methods for solving approximately the compressible-laminar-boundary-layer equations are investigated in order to determine a convenient and accurate method of calculating boundary-layer characteristics. The chief methods considered are the one-parameter Kármán-Pohlhausen method with three different assumptions for the velocity profiles and the two-parameter method with two different assumptions for the velocity profiles. Comparison of the results is made with those of known exact solutions for skin-friction and heat-transfer coefficients, velocity profiles, velocity derivatives, and especially laminar-boundary-layer stability. From this comparison, it is found that Kármán-Pohlhausen method with the sixth-degree polynomial as the velocity profile is the most suitable for many practical purposes. NACA TN 2655.

ENTWICKLUNG EINER LAMINAREN GRENZSCHICHT HINTER ABSAUGESTELLE (DEVELOPMENT OF A LAMINAR BOUNDARY LAYER BEHIND A SUCTION POINT), by W. Wuest. Mar 1952. 18p graphs Microfilm $1.75, Photostat $2.50. PB 106619

A theoretical investigation is made of the development of a laminar boundary layer behind a suction slot that is assumed to cut off part of the boundary layer without exerting any sink effect. The development, which is approximate, is based on the heat conduction equation. The heat conduction equation enters the analysis through a linearization of the Prandtl-Mises form of the boundary-layer equation. Translated from Ingenieur-archiv, vol. 17, 1949, p. 199-206. NACA TM 1336.

EXPERIMENTAL INVESTIGATION OF A 90° CASCADE DIFFUSING BEND WITH AN AREA RATIO OF 1.45:1 AND WITH SEVERAL INLET BOUNDARY LAYERS, by Daniel Friedman and Willard R. Westphal. U. S. National Advisory Committee for Aeronautics. Apr 1952. 30p photos, diagrs, graphs, tables Microfilm $2.00, Photostat $3.75. PB 106629

An experimental investigation was conducted in order to determine the performance of a 90° cascade diffusing bend with an area ratio of 1.45:1 and a 19-inch-square inlet with several inlet-boundary-layer shapes and thicknesses. The maximum mean inlet Mach number was 0.41 and the corresponding airfoil Reynolds number was 950,000. The experimental results seem to indicate that, when the duct configuration requires a bend, a certain amount of diffusion can be obtained without an appreciable rise in the total-pressure losses. If length is important, this configuration requires much less space than the usual diffuser-bend combinations. NACA TN 2668.

EXPERIMENTAL INVESTIGATIONS OF THE TURBULENT-BOUNDARY-LAYER TEMPERATURE RECOVERY FACTOR ON BODIES OF REVOLUTION AT MACH NUMBERS FROM 2.0 TO 3.8, by Howard A. Stine and Richard Scherrer. U. S. National Advisory Committee for Aeronautics. Mar 1952. 19p diagrs, graphs Microfilm $1.75, Photostat $2.50. PB 106559

A turbulent-boundary-layer temperature recovery factor of 0.885 ± 0.011 was measured on both a 10° cone and a 40° cone cylinder at Mach numbers from 2 to 3.8 Reynolds numbers based on surface kinematic viscosity from 4×10^5 to 4×10^6. Comparisons are made with available theories and experiments. NACA TN 2664.

INDUCED SIDEWIND BEHIND SWEPT WINGS AT SUBSONIC VELOCITIES, by Willi Jacobs. Flygtekniska Försöksanstalten (FFA) Stockholm. 1951. 24p diagrs, graphs Microfilm $2.00, Photostat $3.75. PB 106405

For yawed swept wings a sidewind is induced behind the wings due to the additional lift distribution which is proportional to the angle of yaw , ' . The strength of this induced velocity field is dependent on the angle of sweep and on the Mach number. As the completion of a previous report [1] a method is described to calculate the induced sidewind for the above case, also in a simplified manner. In connection with the previous report, the calculation by this simplified method is now possible for all antisymmetrical lift distributions occurring in practical use. FFA no. 41.

LAMINAR BOUNDARY LAYER OVER FLAT PLATE IN A FLOW HAVING CIRCULAR STREAMLINES, by Artur Mager and Arthur G. Hansen. U. S. National Advisory Committee for Aeronautics. Mar 1952. 28p diagrs, graphs, tables Microfilm $2.00, Photostat $3.75. PB 106558

The laminar-boundary-layer development over a semi-infinite flat plate placed in a flow with concentric circular streamlines was investigated with the limitation of small total turning of the main-stream flow. The shape of the velocity profiles in the direction of the main-stream flow and perpendicular to it was analytically determined for an incompressible flow and a compressible flow with Prandtl number equal to 1. The boundary-layer thickness was shown to be proportional to the square root of the distance from the leading edge of the plate when measured along the streamline of the main-stream flow. The deflection of the boundary-layer flow at the plate surface from the direction of a circular streamline in the main flow was shown to vary directly with the turning. With increase in the Mach number of the main-stream flow, both the boundary-layer thickness and the deflection increased. NACA TN 2658.

MEASUREMENTS OF AVERAGE HEAT-TRANSFER AND FRICTION COEFFICIENTS FOR SUBSONIC FLOW OF AIR IN SMOOTH TUBES AT HIGH SURFACE AND FLUID TEMPERATURES, by Leroy V. Humble, Warren H. Lowdermilk and Leland G. Desmon. U. S. National Advisory Committee for Aeronautics. 1951. 18p diagrs, graphs Available from Superintendent of Documents, Government Printing Office, Washington 25, D. C. $.20. PB 106518

An investigation of forced-convection heat transfer and associated pressure drops was conducted with air flowing through smooth tubes for an over-all range of surface temperature from 535° to 3050° R, inlet-air temperature from 535° to 1500° R, Reynolds number up to 500,000, exit Mach number up to 1, heat flux up to 150,000 Btu per hour per square foot, length-diameter ratio from 30 to 120, and three entrance configurations. Most of the data are for heat addition to the air; a few results are included for cooling of the air. The over-all range of surface-to-air temperature ratio was from 0.46 to 3.5. NACA Report 1020.

NOTE ON THE SOUTHWELL METHOD FOR ESTIMATING CRITICAL LOADS, by H. L. Cox. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Feb 1947. 8p graphs Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.65. PB 106371

1. Loads, Aerodynamic - Gt. Brit. 2. Southwell method (Critical load determination) 3. ARC RM 2696.

Cover date is 1951. S. O. code no. 23-2696.

NOTE ON WALL INTERFERENCE IN TWO-DIMENSIONAL FLOW AT SUBSONIC AND TRANSONIC SPEEDS, by G. Drougge. Flygtekniska Försöksanstalten (FFA) Stockholm. Jan 1951. 14p graph, diagr, tables Microfilm $1.75, Photostat $2.50. PB 106404

In this note some aspects of the problem of wind-tunnel interference are discussed. The investigation, which is restricted to two-dimensional flow at zero angle of attack, deals first with the Mach Number distribution on a profile between walls as computed with linearized theory. The distribution is computed for different wall distances (one of which in infinite) and the free stream Mach Numbers are chosen so that the maximum Mach number on the profile remains the same. After that it is found that the distributions agree fairly well also in the other points of the profile. This result gives support to the validity of the method of finding the corrected Mach Number by using models of different sizes and extrapolating the sizes to zero. Next, the process of extrapolating is investigated and it is found that a good value of the corrected Mach Number may be obtained from measurements on two models of different sizes (or, on one model size and for two different wall distances). Finally use is made of the transonic approximation to obtain some sort of similarity law for the flow around profiles between walls and also to deduce how the drag coefficient varies, when the free stream Mach Number and the wall distances are varied so that the Mach Number distribution on the profile remains the same. FFA no. 40.

SUPERSONIC CONICAL FLOW, by Stephen H. Maslen. U. S. National Advisory Committee for Aeronautics. Mar 1952. 32p diagrs, table Microfilm $2.25, Photostat $5.00. PB 106528

A numerical method is described for the solution of the nonlinear equations for supersonic conical flow. The procedure is a combination of the method of characteristics and the relaxation process. A method for calculating the position of the shock is inherent in the analysis. The method presented is applicable to any conical flow and a solution for the flow about a triangular wing with supersonic leading edges is included as an illustration. NACA TN 2651.

TWO-DIMENSIONAL SUBSONIC FLOW PAST ELLIPTIC CYLINDER BY THE VARIATIONAL METHOD, by G.V.R. Rao, New York University. U.S. National Advisory Committee for Aeronautics. Mar 1952. 39p diagrs, tables Microfilm $2.25, Photostat $5.00. PB 106560

A method of solution is presented for compressible fluid flow past an elliptic cylinder by means of the variational method. The solution is obtained as a function of thickness ratio and free-stream Mach number. Numerical examples are carried out for several thickness ratios and Mach numbers and the results are compared with those obtained by other methods. It is seen that the variational method yields good results for flow past a thick body at a low Mach number as well as for flow past a thin body at a high Mach number. NACA TN 2666.

Land Transportation

CONSTRUCTIONAL DRAWINGS OF ELECTRIC BRAKE AND SIGNALLING EQUIPMENT FOR RAILWAYS. VEREINIGTE EISENBAHN-SIGNALWERKE G.M.B.H., BERLIN. PART II: 1925-1946. 860f drawings (Legends in German) Microfilm $9.00, Enlargement Print $112.50. PB 106066

1. Micro BIOS FD 398/51, Frames 574-1391.

Abstract is PB 106065s. For pt. I see PB 106065.

DIESEL LOCOMOTIVES. REPORT OF A VISIT TO THE U. S. A. IN 1950 OF A PRODUCTIVITY TEAM REPRESENTING THE DIESEL LOCOMOTIVE INDUSTRY. Anglo-American Council on Productivity. Nov 1950. 78p photos, map, drawings Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.75. PB 106410

1. Locomotives, Diesel.

Marine Transportation

KRIEGSMARINE-NORMEN (MARINE STANDARDS). Germany. Kriegsmarine. Apr 1941. 378f drawings, tables (Text in German) Microfilm $9.00, Enlargement Print $50.00. PB 106520

1. Marine engineering - Standards - Germany.

ONI, London, Reel 21-1A. PG-7023-MD.

PROBLEMA DEL SALVATAJE DE LAS TRIPULACIONES DE SUBMARINOS ACCIDENTADOS (PROBLEM OF RESCUING THE CREW OF CRIPPLED SUBMARINES), BY MARCELO FIERRO. TRANSLATED by F. Rizzo. Jan 1952. 23p Microfilm $2.00, Photostat $3.75. PB 106342

1. Submarines - Personnel - Rescue methods - Argentine Republic 2. NAVSHIPS T448.

Date of original is Apr 1951.

WATER SUPPLY, SANITATION AND PUBLIC HEALTH

REPORT OF THE AD HOC COMMITTEE ON FLUORIDATION OF WATER SUPPLIES. National Research Council. Division of Medical Sciences. Nov 1951. 9p Available from National Research Council, Division of Publications, 2101 Constitution Ave., Washington 25, D. C. $.10. PB 106340

1. Sodium fluoride - Physiological effects 2. Water supply - Fluoridation 3. Teeth - Caries - Effect of sodium fluoride.

Kenneth F. Maxcy, Chairman.

MISCELLANEOUS

ACCURACY OF PRESENT WAVE FORECASTING METHODS WITH REFERENCE TO PROBLEMS IN BEACH EROSION ON THE NEW JERSEY AND LONG ISLAND COASTS, by Willard J. Pierson, Jr. U. S. Beach Erosion Board. Apr 1951. 80p diagrs, maps, graphs, tables Available free from The Beach Erosion Board, U. S. Corps of Engineers, 5201 Little Falls Road, N. W., Washington 16, D. C. PB 106577

1. Waves, Ocean - Surface elevation 2. New York. University, New York, N. Y. 3. ENG BEB TM 24.

Prepared under a contract sponsored by the Beach Erosion Board, Corps of Engineers, at New York University.

AUTOGENPRAXIS OHNE VIEL WORTE (OXY-ACETYLENE WELDING IN FEW WORDS) t. 1 by Herman Holler. Hanseatische Acetylen Gasindustrie, A. G., Hamburg, Ger. n.d. 46f drawings, graph (Text in German) Microfilm $2.50, Enlargement Print $7.50. PB 106068

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